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LOCAL ANESTHESIA IN OTO-RHINO-LARYNGOLOGY.*

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Twenty-eight years ago, Jelinek applied cocain in endo-laryngeal examinations and operations, and thus revolutionized oto-laryngology. Tuerck previously swabbed the larynx several times with the following mixture: 18 centigrams acetate of morphine, 4 grains of concentrated alcohol and 15 grams of chloroform. Later he used a more concentrated solution of morphine (8 per cent). Moreover, he noticed that vertigo, sensations of drunkenness, cephalagia, muscular weakness, nausea and vomiting; sometimes even myosis, flickering before the eyes, retention of urine, feeble pulse, etc., invariably resulted, continuing at least six hours, sometimes several days. Tuerck attributed no analgesic action to the chloroform, he thought it merely exfoliated the epithelium and aided the penetration of the morphin into the tissues.

In order to procure a hyperemic condition of the mucous membrane which would aid the penetration of the narcotic, Schroetter pencilled the interior organ vigorously at least twelve times with pure chloroform; then after an hour's rest, again twelve times with an aqueous solution of chlor-hydrate of morphin (10 per cent). The patient then retired but was carefully watched for fear of suffocation. The following morning at eight, sufficient anesthesia had resulted to permit of operation.

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Translated by Leonore Goldstein, St. Louis.

With the adjunct of adrenalin an ischemic action was added to the analgesia; and the use of Bonain's mixture has been found of great service in aural surgery. By combining this analgesia with other mixtures it can be used as an infiltration anesthesia, as suggested by Schleich, Braun, Ceci and Reclus.

A. GENERAL TECHNIC.

The entire equipment necessary for infiltration-anesthesia are the anesthetic and the syringe. Even in the longest oto-rhino-laryngological operations, the syringe of 2 ccm. recommended by Reclus proves satisfactory. For anesthesia of the aural canal a syringe of 1 ccm. suffices, only several drops of the fluid being necessary. It is essential that the syringe be easily sterilized and that the piston does not allow the liquid to escape.

While our anesthesia is conveyed only to the free surface of the tegument (face, mastoid region, neck), a straight needle, long and strong, such as general surgeons use, answers our requirements. We shall not need more when injecting a straight cavity such as the aural canal or nasal fossae; a needle which can be fixed to the body of the syringe at an angle which will not obstruct the view is also necessary and which is constructed like most of our instruments used in endo-auricular and endo-nasal operations. Moreover, the direct endo-laryngeal method of infiltration, such as Heryng advocates, requires a long needle cannula bent like the customary laryngeal instruments. To anesthetize the tonsil, as I shall show later, an appropriately curved needle is also necessary.

For many years, chlor-hydrate of cocain has been without a rival for local anesthesia. It cannot be disputed that when we contain, eucaïn, tropo-cocain). The addition of a trace of adrenalin power, it surpasses any of the remedies which succeeded it, (stovain, eucaïn, tropo-cocain). The addition of a trace of adrenaline to this salt has only strengthened its therapeutic action, prolonging its analgesia effect upon the tissues, and doubling the no less beneficial ischemic action.

Cocain, however, may produce serious toxic effects when penetrating the tissues. Notwithstanding the precautions that have been prescribed by Reclus for its proper application regulation, we may still find occasional cases in which this drug produces serious effects.

Novocain has an analgesic effect almost equal to that of cocain, and when used in conjunction with adrenalin, it produces an equally durable anesthesia, and is four times less toxic than cocain. These

advantages have given it universal recognition, at least for infiltration anesthesia.

The solution commonly in use in hospital work is the following: Physiologic fluid, 200 gr.; novocain, 0.50 gr. To this solution 25 drops of adrenalin solution (1-1000) are added at the last moment because of the difficulty of conserving a mixture of novocain and adrenalin. Reclus recommends the reclining position for infiltration-anesthesia. Under these conditions, Reclus and his assistants were able to inject seemingly impossible quantities of this solution with impunity. In his excellent manual on "Local Anesthesia," Piquand reports having once injected for a hernia operation 38 syringes of fluid, amounting to 76 ccm. of solution, which amount represents 0.38 grs. of novocain and 19 drops of an adrenalin solution of 1-1000. In another case (radical operation for extensive varices) he injected 88 ccm. Piquand cites an instance where Chaput injected the formidable dose of 140 ccm. without inconvenience to the patient.

Fortunately the doses in oto-rhino-laryngologic cases approaches no such figures. I have not used more than from 6 to 8 syringes of fluid in the most extensive cases. For this very reason and because of the sensitiveness of the operated centers, I have always used a dose of novocain, double that used by Reclus. (Serum, 100 ccm.; novocain, 1 ccm. To this I add at the last moment 25 drops of adrenalin solution of 1-1000.)

I also wish to mention another analgesia, alypin, which Piquand thinks produces as much, if not greater, toxic effect than cocain, and which has an irritating effect upon the tissues. Goris recommends it as having a less depressing heart action than cocain; he, therefore, uses it in all extensive operations upon the thyroid.

Infiltration-anesthesia may be attained in two ways—direct, local anesthesia or infiltration of the operative field—and the indirect method, resulting from infiltration of one or more corresponding nerve trunks.

The first method implies the same technic used in anesthetizing the tegument (mastoid, tracheotomy, radical frontal sinus) or the mucosa (submucous resection of the nasal septum, staphylorrhaphy, radical maxillary operation). The analgesia of the tegument or mucosa is begun by injections into the thick part of the tegument or mucosa, observing all the precautions outlined by Reclus and his pupil, Piquand. After this the subcutaneous or submucous injection is made and the liquid diffused throughout the operative field by careful massage, (Schroetter, Vienna, 1897). If

the operation involves the bony structure, the sub-cutaneous and submucous injections must be followed by one or more injections carried along the periosteum, in direct contact with the bone, and the liquid diffused by proper massage.

The other method of regional infiltration-anesthesia cannot be as generally applied as the preceding because it depends on the accessibility of the anesthetizing injection to the nerve ends which control the sensibility of that region. Analgesia of the sub-glottic and glottic region of the larynx was accomplished by Braun, Frey, and Valentin by infiltration of the superior laryngeal nerves; analgesia of the maxillary antrum by Munch and Jeay by infiltrating the superior maxillary nerve at the level of the pterygo-maxillary fossa, just as von Eicken succeeded in anesthetizing the aural canal by infiltration of the nerve branches of the auricle and the auricular-temporal nerve. Piquand obtains anesthesia of nasal and frontal regions by infiltrating the corresponding nerves at certain points where they cross the orbit. I also have successfully applied this method in several instances. The effects of regional infiltration are a little variable because one is never absolutely certain to have reached the nerve-end desired; therefore, this method should be complementary to infiltration.

Moreover, most of our more important operations through external routes deal with cavities that are covered with mucous membrane, accessible through a natural orifice. In all such operations I combine infiltration of the external operative field with anesthesia by introducing gauze impregnated with a solution of cocaine of 1-5 to which several drops of adrenalin, 1-1000, have been added. Following this principle, the maxillary antrum scarcely open is packed with a similarly impregnated strip of gauze, which is allowed to remain there from 5 to 10 minutes. Similarly in laryngo-fissure I follow Moure's method of packing the laryngeal cavity in the same manner after the thyroid cartilage has been incised along the median line.

I never perform an ossiculectomy except in certain forms of long-standing otorrhea, where there is necessarily a punctured drum, which I utilize to employ both procedures of anesthesia, infiltration and contact. Through the puncture I introduce a small cotton tampon saturated with Bonain solution, after which I make an injection into the superior wall of the canal. In the deeper situated operations of the cervical region (laryngectomy, removal of goiter, opening of the deeper phlegmon, ligature of the jugular, where it is impossible to judge to what extent the anesthesia has pene-

trated), it is necessary to re-apply a strong solution of chlorhydrate of cocain or, better still, Bonain solution, each time that the complaint of the patient indicates that the limits of the anesthetized zone have been exceeded.

Before entering upon the details of the application of anesthesia in the different operations, I deem it necessary to mention certain preliminary precautions which I have found of great importance.

The patient should partake of light, digestible food two hours before the operation, but of no stimulants. I disapprove of the pre-operative administration of drugs such as caffein, that only excite latent nervousness, and provoke just such accidents as we wish to avoid. The physician who for the first time witnesses one of these accidents is deeply impressed. The whole clinical picture is one of a profound disorder of the cardio-pulmonary function, of imminent danger, but usually only a case of nervopathic disturbance provoked by the absorption of drugs by a predisposed subject and in most cases, left to themselves, the toxic effect is gradually dissipated. My first encounter of this nature was a young girl whose larynx I had painted liberally with a strong solution of chlorhydrate of cocain. After the prevailing custom, I injected caffein and gave her several cups of coffee, which but increased the labored breathing and her agitation. A confrere, hastily summoned, advised a morphin injection, which promptly calmed the patient, who, it was learned, was subject to hysteria. Since then I have always used morphin in such cases if the symptoms were slow in diminishing. I regard morphin as an antidote for cocain and its successors and use it not only as a curative agent, but as a preventive. I inject in the adult patient at least 1 centigram of chlorhydrate of morphin one hour before operating in all cases where I use local anesthesia. Where I deal with an exceptionally nervous and excitable patient, I double this dose. Anxiety is considerably reduced, and where the local anesthesia has been very effective, the most impressionable patient is in a slight stupor which is not sufficient to preclude his co-operation, such as sitting up to blow the nose or to expectorate. I have found this method to be in vogue with many of my colleagues, and also with St. Clair Thomson, Cenci, and Siebenmann.

B. INDICATIONS AND CONTRA-INDICATIONS.

When applicable pre-operative local anesthesia is always of advantage to the operator and to the patient. In a large majority of our operations it is justifiable and to-day there seems to be a

marked sentiment, at least in our field of work, to prefer local anesthesia to complete narcosis. In cases like laryngectomy it would have seemed folly but a few years ago to have proposed using the method of anesthesia which to-day is employed. Only certain mastoid infections with diffuse osseous involvement, certain malignant nasal or naso-pharyngeal neoplasms because of their exceptionally diffuse character alone contra-indicate local anesthesia. The objection of the patient should be overcome by representing the dangers of complete narcosis. Total anesthesia is usually unnecessary in children; their nervousness can be overcome by sending the parents out of the room, by kindness and by an injection of $\frac{1}{2}$ centigrams of morphin.

If we are dealing with very young patients, with whom it is impossible to reason and who may readily be chloroformed, it would seem preferable to employ the latter method for all major operations that preclude the use of ethyl bromid, or any other of the narcotics of short duration. Here again, generally accepted ideas seem destined to change. Only recently Sargnon successfully used local anesthesia in a case of acute mastoiditis in a nursling of 3 months. Last December I followed his example in the case of a child of the same age suffering from acute mastoiditis, with most satisfactory results.

I have thus far only spoken of simple points in favor of local anesthesia—advantages to patient and operator, absence of nausea and of sequelae more or less imaginary on the part of the patient. I now wish to call attention to those cases, not rare, in which general narcosis entails dangers, due to subnormal conditions in the patient. I speak only of chloroform; ether, it seems to me, is most often contra-indicated in our field because of the strong cephalic congestion which follows its use and because of the inconvenience of the large mark in head and neck operations.

I do not agree with those who fear the use of chloroform in patients of advanced age, or those with cardiac disturbance, and am not alone in the view that aged persons generally tolerate chloroform narcosis very well, especially when their organs are in good condition, particularly the liver. In speaking of cardiac cases, Huchard, who is recognized as an authority in this field, makes the same statement in even pronounced valvular lesions, provided that the lesion remains compensatory and that the other organs perform their functions regularly; other surgeons to whom I have spoken are of the same opinion.

There are patients with former lesions of kidney or liver in whom recent experiments have clearly established an elective chloroform intoxication upon the cellular elements of these organs. The experiments of Doyon and Billet upon dogs subjected to chloroform intoxication show acute epithelial nephritis and abundant hemorrhage of the liver with degenerative lesions. Fiessinger's experiment points to similar results.

I use the term chloroform intoxication intentionally, for as Queny³ remarks, chloroform does not merely benumb for the time being the nervous system, but it generally impregnates the tissues, causing a constant cellular change of different degrees of power and duration.

To-day we know that, after the chloroform vapor reaches the lung, it passes to the left ventricle and into the arterial circulation, affecting the cellular tissues rich in lipoid substance, especially those of the nerve centers, which explains the temporary loss of consciousness. Penetration into the blood and tissues is followed quite naturally by elimination through all the routes of excretion, particularly through the liver and kidneys, but not without detriment to these organs, whose cellular elements are thereby more or less altered.

The practical conclusions to be drawn are that a renal or hepatic infection in a patient is an absolute indication for the use of local anesthesia if possible. Auburtin, Gurcel, and Quenu, have proved that the administration of chloroform, especially if of prolonged duration, may determine lesions and clinical processes, bringing on serious cases of jaundice, even in young patients in whom not the slightest organic defect had been suspected.

In the diabetic I consider local anesthesia to be peremptory. Since I have noticed how many diabetic patients can endure serious and prolonged surgical manipulation under local anesthesia, while those that have been operated under chloroform narcosis frequently succumb within the week, I have reached the conclusion that the fatal operations are less the result of the operation itself or of shock, than of chloroform intoxication inflicted upon an organ that has weakened powers of elimination.

C. SPECIAL TECHNIC IN DIVERSE OPERATIONS.

A. *Nasal Fossae and Accessory Cavities.*

1. Submucous Resection of the Cartilaginous Septum:—In this operation local anesthesia is easily and completely effected, while the addition of adrenalin prevents hemorrhage. Anes-

thetia by contact and by infiltration can be advantageously combined by applying to all the mucous membrane of the septum that can be reached, on each side, large flat tampons, saturated with a strong solution of adrenalized chloro-hydrate of cocain—water, 5 gr.; adrenalin solution, 1-1000, 5 gr.; chlor-hydrate cocain, 2 gr. After five minutes the tampons are withdrawn and a submucous injection is made of a solution of novocain 1-100 with adrenalin. The zone of mucous membrane thus blanched will indicate the extent of the anethesia. If the bone is thickened, an injection should not be omitted at the level of the inferior insertion of the cartilage on both sides under the mucosa of the floor of the nose against the septum. All pain is thus avoided when gauze and mallet are used. This procedure raises the mucous membrane in preparation for its detachment by means of an elevator. Ten minutes after the last injection, the operation may be undertaken.

2. Polypoid Hypertrophy of the Mucosa of the Inferior Turbinate. Posterior End:—In this class of cases it is not uncommon to find at the moment of operation that the patient's nervousness produces much the same depletive effect upon the mucosa of the cavity that is noticed in the generative organs—the hypertrophy wholly or almost disappears when the attempt is made to remove it with either the cold or hot snare. The same result follows the application of cocain. On the other hand, if the tissue be infiltrated, it becomes blanched, but the hypertrophy is increased and removal made easier.

3. Radical Operation for Nasal Myxoma. Resection of the Middle Turbinate-opening of the Ethmoid Cells:—Chloro-hydrate of cocain (1-5) with adrenalin should be used in the first operation. A tampon saturated with this solution is first passed between the myxoma which obstruct the view of the middle turbinate, taking care to apply the swab at their base, after which they are removed with little pain. The middle turbinate, now in view, is literally enveloped in gauze saturated with the same solution, one tampon being placed along its concave surface, a second between it and the septum, and a third along its free edge. After 15 minutes, the turbinate may be resected in two or three insertions of the instrument. The amount of anethesia obtained by this means varies in different patients. Recently I have successfully applied infiltration-anethesia directly in resecting the anterior part of the middle turbinate. The nose is held open by a speculum constructed upon the lines of a simple palpebral probe, which does not

extend exteriorly over the nasal orifice. The injection is made into the mucous membrane at the head of the turbinate, by means of a long needle cannula syringe bent like a nasal probe. Several drops injected suffice to produce the discoloration of the mucous membrane, whereby the anesthetic action is indicated. By this means complete analgesia of the larger part of the turbinate is obtained of which the anterior end may be removed in one or two applications of the flat forceps without great inconvenience to the patient.

The nasal branch of the ophthalmic nerve divides at the level of the anterior ethmoid opening into an external, and interior nasal or ethmoidal branch. The latter, the only one of interest to us at present, passes into the opening in question, extends from without to within, above the cribriform plate and penetrates into an elliptical orifice situated at the side of the crista-galli, where it passes into the nasal fossa; here it divides into an internal branch which supplies sensibility to the anterior half of the mucosa of the septum, and into an external branch supplying the anterior region of the mucosa of the turbinates and the meati; the posterior region of the internal and external walls owes its sensibility to the efferent branches of the spheno-palatine ganglion; that is to say, to the superior maxillary nerve, which supplies it with its sensitive roots.

From these anatomical facts it will be seen that in making an injection in the ethmoidal branch of the nasal nerve and in the superior maxillary nerve at the level of the spheno-palatal ganglion, local anesthesia of the two walls of the corresponding nasal fossa will at once be produced.

Unfortunately this procedure can only be easily done through the first of these two nerve-branches in question. The ethmoid opening, at whose level it is most accessible, is only a little further away than two centimeters from the orbital arch. Nothing is simpler than to reach the nerve at this level by passing the needle of the syringe along the superior internal angle of the orbital cavity to the depth indicated. For infiltration of the superior maxillary nerve along the spheno-palatal nerve, three routes have been suggested: (1) The anterior or orbital route, that of Chevrier, which consists in passing the needle along the external part of the floor of the orbit as far as its crest, but which is very uncertain because of the absence of definite points. (2) The inferior or buccal route, proposed by Jeay and made after Schlosser's method of alcohol injections of the trigeminal in cases of neuralgia. Its aim is to reach

the nerve by means of a needle bent like a bayonet, which is inserted back of the wisdom tooth from below upward between the maxillary eminence and the pterygoid process. This is an ingenious method, but difficult of execution, and does not seem to attain the same degree of analgesia as the following method, since the needle may never reach the nerve. Schloesser himself abandoned it for the third method. (3) The external or sub-zygomatic method was proposed by Munch and adapted from Bandoïn and Levy's method of alcohol infiltration of a nerve affected with neuralgia. A strong needle is passed through the tegument perpendicular to its surface, under the inferior edge of the zygomatic arch at the point of its intersection with a downward vertical line which extends from the posterior edge (easy to locate) of the external orbital process to the malar bone. After passing through the skin, the needle is directed upwards and inward, toward the lower edge of the nasal bone, to a depth at first of about 4 cm. There several drops of the solution are injected (cocain, 1 per cent, with adrenalin) to reduce the pain in this region which is so rich in nerve filaments. One centimeter deeper the nerve is reached, where the rest of the solution in the syringe is injected. Twenty minutes later the operation may proceed.

The same method cannot so easily be applied to the superior maxillary nerve. In anesthetizing the maxillary antrum, one may reach the nerve trunk at its entrance into the infra-orbital canal at $2\frac{1}{2}$ ccm. from the inferior border of the orbit, in passing the needle from the front backward along the orbital floor, from the middle of this border, but that portion of the nerve to which the ganglion of Meckel is attached is a centimeter distant, not directly behind, but obliquely inward and backward, and disguised under the internal edge of the most distant part of the spheno-maxillary slit or cleft, and under the bridge of fibrous tissue which unites the two edges of this cleft or fossa. To reach it the needle must accomplish something that is mechanically impossible, after having penetrated as far as the entrance of the nerve into the sub-orbital canal, change its direction obliquely inwardly and a little downward. At the most, one may hope that, after the injection has passed through the fibrous tissue that fills the spheno-maxillary cleft, a small part of the liquid may penetrate by infiltration as far as the point aimed at.

My experiments of the past months have only confirmed the theories which precede and which show that it is always at the base

of the most distant part of the turbinate and of the middle meatus that complete anesthesia is most difficult to attain. I have abandoned all attempts at local anesthesia of the maxillary nerve. I systematically resort to infiltration of the nasal nerve, which seems to me to produce the most complete anesthesia of the anterior region of the turbinate and middle meatus. I succeed in obtaining anesthesia of the posterior regions by pushing the saturated gauze as far back as possible and in renewing the application after the removal of the anterior end of the middle turbinate and the opening of those ethmoid cells most anteriorly removed.

4. Moure's Operation for Disposal of Naso-Maxillary Malignant Growths:—On October 5, a man, 66 years old, consulted me. His right nasal fossa had been obliterated for several months by a neoplasm of which I removed the largest part through the naris with my flat forceps. The histological examination made by Dr. Deglos showed cylindrical epithelioma. Urinalysis showed sugar in the proportion of 40 gr. to the liter. I suggested a more complete removal of the neoplasm under local anesthesia, which was carried out. The details follow:

October 10, at seven o'clock, a light breakfast; at 7:30 an injection of $1\frac{1}{2}$ centigrams of chlor-hydrate of morphin. When the patient arrived at the clinic, one hour later, he was in a light stupor. At 8:30 anesthesia was begun. With the aid of the mirror, several large tampons saturated with a strong adrenalized cocain solution were introduced high into the nasal fossa, where I knew the neoplasm was located. Intra-dermal infiltration with weak adrenalized novocain along the line of the incision, extending from the inner half of the eye-brow (for opening frontal sinus), descending along the side of the nose to the ala nasi. Infiltration of the ethmoid nerve. Deep injection of five syringe-fulls at the bony surface where the resection was to be made. Ten minutes after the last injection, the cutaneous incision was made. After separating these edges, I performed the greater part of the bony resection, detaching the mucosa from the pre-maxillary ridge. An anesthetizing injection was made in the deeper area of this mucosa, after which it was resected.

The neoplastic tissue now in view was completely removed with flat forceps and curette until the bone was entirely stripped. The sphenoid autrum showed myxomatous degeneration, as did the frontal sinus, in which a large opening was made. During this operation of thirty-five minutes' duration, including sutures, the pa-

tient experienced no pain and both extra- and intra-nasal interventions were without bleeding. One month later the nasal fossa was free, but just above the insertion of the inferior turbinate there was a grape-like formation of suspicious appearance on the antro-nasal wall. Maxillary antrum of this side less permeable to buccal transillumination than the left side, which caused me to suspect a neoplasm. The suspicious grape-like growth was removed; histologic examination established it as epithelioma. On November 15, the nasal fossa and maxillary antrum were re-opened. At that time, through diet, the glycosuria had been reduced to 5 grams to the liter, but I still used local anesthesia, not only to the field of the first operation, but also to the mucosa of the labio-gingival fold and to the pre-maxillary area.

The maxillary antrum was opened widely through the canine fossa. Its mucosa had undergone the myxomatous change, which explained the negative transillumination, but it did not show the suspected epithelioma. On the other hand, I found cancerous vegetation on the internal face of the antro-nasal wall, by rhinoscopic examination, and I resected all the corresponding part of that wall.

Unable to find further trace of the suspected tissue anywhere in the nasal cavity, I sutured the large cutaneous-mucous wound along its entire length. The second anesthesia was less satisfactory than the first, due to the fact that analgesic infiltration cannot be done so well in cicatricial tissue. I found serious difficulty in anesthetizing an osseous surface which had previously been operated upon, because a part of the injected liquid escaped into the nasal fossa. The patient experienced sharp pain, especially during the retraction of the edges of the facial wound and during the intra-nasal part of the operation. I reduced the pain by re-touching the newly-exposed surfaces with cocain solution and extracted all trace of suspected tissue from the nasal cavity. The ischemic action obtained was quite as satisfactory as the first time. In spite of the extensive operation and the undeniable pain suffered by the patient, his general condition on the following day was satisfactory. In this case, where general narcosis may have been fatal, the infiltration method of the superior maxillary nerve, as described above, seems, a priori, to be applicable in these cases in assuring us of the complete analgesia of the posterior region of the nasal cavity, supplied by the sphenopalatal nerve.

5. Radical Cure for Chronic Maxillary Antrum Disease by the Caldwell-Luc Method:—I have always employed local anesthesia in

these cases, since I realized its great advantages after my visit to Prof. Siebenmann, in Basle, in 1906. Prof. von Eicken established this excellent innovation. In America Gordon-King was one of the first to use it. It has simplified the technic of the operation, especially by reducing hemorrhage which otherwise was profuse and annoying.

The technic which I adopted aims at combining the various methods of local anesthesia: Infiltration before the anterior wall of the antrum, surface application in the antral cavity (with a view to curetting) and in the inferior meatus (to form an artificial hyatus), and infiltration of the superior maxillary nerve, in the sphenomaxillary cleft before it enters the sub-orbital canal. It is at this point that the nerve supplies the two or three posterior dental branches, whose numerous filaments cause the sensibility of the antral mucosa, while the rest are distributed in the spongy tissue of the bone.

Pre-operative anesthesia comprises the following steps: (a) Infiltration with weak adrenalized solution of novocain into the thick part of the buccal mucosa along the projected incision. (b) Infiltration with the same solution under the mucous membranes in front of the anterior wall of the antrum with a long needle inserted toward the sub-orbital opening (in order to render the soft tissues insensible when the superior flap is thrown back followed by a thorough massage. (c) Introduction of a strip of gauze saturated with a strong solution of adrenalized cocain into the depth of the inferior meatus. Several long strips of gauze saturated with the strong adrenalized cocain solution should be at hand to pack the interior of the antrum to insure the ischemic and analgesic effect upon its interior surface before curettement, which in some patients is painful. If intra-antral sensibility persists after the saturated gauze has been in position for ten minutes, I use a swab of Bonain mixture a minute or longer on all the points of the cavity. For the same reason, Hans-Pape advises swabbing the interior of the antrum with a mixture of cocain solution (1 to 10) and oxygenated water, adding the latter to increase the penetrability of the anesthetic into the spongy interstices.

I wish particularly to call attention to the facility for making the artificial hiatus because of the ischemic action resulting on the two surfaces of the external wall of the inferior. The absence of all bleeding permits the operator to have a clear view of the concave face of the inferior turbinate and to work without touching it.

By combining the various steps just enumerated, I have always succeeded in performing the operation without difficulty, even upon very sensitive patients. Those of my colleagues, however, who have had occasion to witness or to perform the operation by a single infiltration, as practiced by Munch, unanimously pronounce the analgesia obtained thus as much superior, in fact, as perfect. The method has been enthusiastically adopted by both French and foreign colleagues.

6. Radical Operation by External Route for Cure of Chronic Suppurative Frontal Sinusitis:—In 1909, I used local anesthesia for the first time in the Killian operation.* Since then, I have applied it in three cases. Besides these, in May, 1909, I assisted my friend, Guisez, who successfully performed a radical operation for suppurating fronto-ethmoido-maxillary sinusitis under local anesthesia upon an elderly, icteric, cardiac case. In all my interventions by external route upon the frontal sinus, in which I systematically employ a slightly altered Killian technic, local anesthesia has invariably yielded such satisfactory results that I shall continue its use. Prof. von Eicken informed me that in 1909 he had performed two Killian frontal sinus operations under local anesthesia while assisting at the Siebenmann clinic and that he was satisfied with the results. Sargnon reports having used it twice, but only with semi-satisfaction, admitting, however, that he failed to anesthetize the nasal cavity and ascribed imperfect result to this omission.

Direct anesthesia of the corresponding nasal cavity constitutes an important element of success, especially when the antral opening is combined with the superior nasal maxillary foramen after the method of Taptas-Killian. A large part of the operation is really done through the nasal cavity. The sensibility of the mucosa of the frontal sinus and of its walls is due to the internal and external branches of the frontal nerve and to a branch furnished to it by the internal nasal or ethmoidal nerve in its course from the internal anterior orbital opening to the crista-galli.

Relying upon these facts, I developed the following technic in which again the various methods of local anesthesia are combined: (a) A long strip of gauze saturated with a strong cocain-adrenalin solution is introduced into the superior and anterior parts of the nasal fossa toward the infundibulum. (b) Infiltration of the skin with a weak novocain-adrenalin solution along the curved course of the Killian incision. If previous radioscopic examination has shown that there is much extension into the antrum vertically and

consequently the necessity for a liberal incision, perpendicular to the first, such corresponding infiltration is also made. (c) Subcutaneous infiltration toward the periosteum against the frontal bone in a direction corresponding to that of the proposed bony resection, followed by massage.

Except in cases of unusual sized antrum in the vertical direction, I seldom infiltrate the frontal region, preferring to follow the example of Jacques, who only opens the antrum through its floor. On the other hand, I never neglect to make several injections to the periosteum on each side of the proposed line of incision at the level of the brow, as well as to the superior naso-maxillary region. This alleviates the particularly painful act of bone scraping. Because I always enter the antrum at the level of its floor, I attach importance to anesthesia infiltration of the periosteum of the superior wall of the orbit in its middle and internal parts; this also produces local anesthesia of the nasal and frontal nerves whose function in the innervation of the mucosa and walls of this cavity has just been mentioned. The ethmoidal nerve distributes its filaments to the anterior part of the mucosa of the meatus, turbinates and septum—that is to say, to that region of the infundibulum where the last part of the operation is performed. Anesthesia has already partially been accomplished here by the introduction of the strip of gauze saturated in cocain solution.

Infiltration of the frontal nerve is none the less easily affected. This nerve through its two terminating branches controls the sensibility of the antral mucosa; for this reason it should be injected before its bifurcation, which takes place at the anterior third and middle third of the superior wall of the orbit.

We must remember that in its course from the back to the front along this cavity, the nerve is adjacent to the periosteum and situated slightly within the median line. As the antero-posterior axis of the orbit measures 5 cm. in the adult, we will be sure to reach the nerve trunk back of its bifurcation if the needle is plunged along the superior wall a little within the median line to a depth of 2 cm. As the needle may meet one or more of the terminal branches, it is advisable to inject a part of the solution slowly at this point and to inject the rest when the unbifurcated nerve trunk is supposed to have been reached. A long strip of gauze saturated with cocain-adrenalin solution should be prepared to swab the antral cavity from below upward, having the opening through its floor as large as possible. If the tampon is left in position for ten

minutes satisfactory analgesia and ischemia will be obtained for the currettement of all spongy masses, so abundant in the chronic form, whether at the level of the infundibulum or in the antrum itself.

7. Opening of the Sphenoidal Sinus Through the Nose. Hypophysectomy by the Trans-naso-sphenoidal Route:—It is natural at the same time to open the sphenoidal antrum whose wall is normally hidden at its external two-thirds behind the ethmoid, and resembles very closely the ethmoid cells furthest removed. Until now I have employed simple contact anesthesia for this operation by swabbing with a strong cocain-adrenalin solution, after which I push the saturated gauze in contact with the sphenoid. Oscar Hirsch, in addition, infiltrates the pre-sphenoidal mucosa by means of a syringe which terminates in a needle, which is curved backward at its extremity. The perfect analgesia thus obtained led to his ingenious method of hypophysectomy via the natural channels in the living subject. In 1909 he published the theoretic description of his experiments upon the cadaver, which since the year following he has applied successfully in the clinic. To gain time in frequent cases where the rapid growth of the neoplasm carries with it great danger the operator made a second attempt at one sitting.

The Hirsch operation in its combination of local anesthesia by contact and anesthesia by infiltration seems to be one of the best applications of this method in rhinologic surgery.

B. Buccal-pharyngeal Region.

1. Staphylorrhaphy:—Analgesia of the palate is easily accomplished and the operation can be performed without bleeding if care is taken to avoid the palatal artery in making the free incisions very near the teeth. Since the most painful step of the operation is the freshening of the edges of the incisions, we no longer infiltrate the mucosa along the line of the projected incision but deep injections are made corresponding to the entire surface of the flaps. In this way complete analgesia and ischemia are realized.

2. Quinsy:—Since the purulent formation is almost always found between the head of the tonsil and the anterior pillar, infiltration of the two pillars will generally suffice to render the opening of the abscess tolerable, if not entirely painless.

3. Tonsillectomy:—For intervention upon the deep tissues of the tonsil, simple swabbing with cocain upon the surface of the tonsil is of no avail. The same may be said of the attempts to infiltrate

the tonsil itself, which is often futile because of the delicacy of the tissues and the tendency of escape of the injected fluid through the follicles. It is easy to infiltrate the two pillars and to render their separation from the tonsil painless; but for analgesia of the latter it is necessary to inject at the deep or external wall where the sensitive branch of the glosso-pharyngeal nerve is found. For this purpose as well as for infiltration of the pillars a curved needle is directed inward between the inferior extremity of the tonsil and the base of the tongue between which there is always a small interstice. Here we encounter the posterior wall of the tonsil cavity where the injection should be made. Five minutes later the operation may proceed. Since I have adopted the infiltration of this deep-seated wall my patients no longer complain of pain during the operation.

C. Cervical Region.

1. Tracheotomy:—Tracheotomy is one of the best applications for local anesthesia. During 1887, I assisted at an operation for tracheal opening made upon a tubercular adult in the clinic of Professor Schroetter, of Vienna, and have since then constantly applied this method in stenosis of the larynx. Intradermal injection exactly along the median line, along the course of the projected cutaneous incision; several subcutaneous injections, diffused by means of massage; ten minutes later the operation may proceed.

The greater number of my French and foreign colleagues who responded to questions regarding this point (Moure, Sargnon, St. Clair Thomson, Botey, Navratil, Citelli), recognized the simplified method of execution as well as the diminution of risk in trachea operations when performed with anesthetic and ischemic infiltration. Citelli even performs the operation with the patient in the sitting posture.

2. Endo-laryngeal operations via the buccal route:—In curettment of galvano-cauterization of tubercular or lupous lesions, removal of neoplasms, simple contact anesthesia (swab or syringe) will suffice in the great majority of cases. In addition, direct infiltration, or infiltration of a sensitive nerve supplying the organ may be used. Direct infiltration was proposed in 1886, by Heryng, especially for pre-operative anesthesia of the arytenoid and epiglottic region when they are the site of deep-seated tubercular infiltrations, for which simple cocain swabbing in operative treatment would be insufficient. A syringe of 2 ccm. is used, to which a long metallic right-angled cannula terminating in a fine needle, is attached. After

the surface has been anesthetized the needle is inserted in the pathologic tissue and the injection made at the level of the tegument to be incised. Unfortunately, the execution is often laborious, the immobility of the organ in such cases being indispensable and difficult to obtain for even a few seconds. Infiltration of the superior laryngeal nerve for local anesthesia of the laryngeal cavity was performed for the first time, independently, by Braun and by Frey at the instigation of Valentin.

Frey's method is as follows: The position of the large cornu of the hyoid bone and the superior cornu of the thyroid cartilage having been noted, the needle is applied at equal distance from these two points, about 3 cm. from the median line, consequently on the side of the thyro-hyoid muscle. After the needle has been embedded to a depth of 1 cm. inward and somewhat backward, the injection is made.

Before applying this method to the human, Frey experimented upon the cadaver and almost without exception the solution of methyl-blue which he used colored the nerve-trunk. This technic is described in Braun's treatise on local anesthesia.

Piquand recommends one notably different:—the thyroid cartilage serves only as a guide; 2 cm. from the median line a little under the border of the thyroid cartilage, the needle, which must be curved, is inserted and the injection of the solution brought in contact with the cartilage. There the contents of a syringe is injected to disengage the muscles, then pushing the point of the needle upward and backwards, novocain is injected along the plane of the superior laryngeal nerve and its surrounding tissues.

No matter what method is employed, it is necessary to note that the most successful infiltration of the superior laryngeal will only produce analgesia limited inferiorly by the glottis, the sensibility of the subglottic portion of the larynx being dependent upon the sensitive filaments of the recurrent. Piquand advises tracing the latter and plunging the needle in the angle coming from the thyroid cartilage, then keeping the point in contact with the internal face of the cartilage, directing it toward the postero-inferior angle of the thyroid, two or three cubic centimeters of the anesthetic solution should be injected at this point into the lateral recesses of the larynx, toward the recurrent. I doubt whether this method is always successful. Even attempts to infiltrate the superior laryngeal are followed by more or less favorable results due to the patient as well as to the skill of the operator. This method should

be considered rather as complementary to direct intra-laryngeal anesthesia and, when combined with the latter, may at times be of appreciable service.

3. Laryngo-fissure:—Here again we have an ideal field for the employment of local anesthesia, providing the various methods are combined. My technic consists of the following steps:

1. Intradermal infiltration along the median line from the hyoid bone to 3 cm. below the inferior border of the cricoid.

2. Infiltration of the two superior laryngeal nerves. The inter-hyo-thyroid space which is so indispensable for the infiltration of the superior laryngeal nerve may often mislead us when used as a guide, especially if the patient be at all fat. Tapia wrote me last autumn that during a sub-hyoid pharyngotomy, combined with laryngo-fissure for cancer of the vestibule of the larynx, performed under local anesthesia, he had discovered the two nerves in question after making the usual incision. He applied to them directly a solution of chlor-hydrate of cocain (10 per cent), which after ten minutes produced an intra-laryngeal analgesia, if not absolute, at least sufficient to control the reflex cough. After opening the larynx, a light cocain swabbing of the exposed mucosa sufficed to permit the easy excision of the ventricular bands and epiglottis. This technic seems indicated in interventions upon the larynx via the external route, and in median cutaneous incisions which open each side of the inter-hyo-thyroid space.

3. Subcutaneous infiltration along the larynx and in contact with it, which is then diffused by massage.

4. With the patient in sitting posture direct anesthesia is applied to the base of the tongue (method of Fournie), to the epiglottis and to the laryngeal cavity in order to prevent annoying reflexes when the larynx is open.

5. A strip of gauze impregnated in advance with a strong solution of chlor-hydrate of cocain-adrenalin is introduced into the laryngeal cavity, where it is allowed to remain several minutes from the time that the thyroid will have been incised, and applied carefully to the neoplasm to be extracted. During this time the laryngeal incision having been extended to the cricoid and to the first ring of the trachea, the two edges of the wound of the latter are kept open for the purpose of respiration and to see that the gauze introduced into the larynx does not fall into the trachea.

Most of my colleagues employ local anesthesia for laryngo-fissure (Moure, Fournie and Sargnon, Navratil, Tapia and Siebenmann).

Ail recognize the perfect analgesia obtained in this space and the possibility of a bloodless operation in the extra-laryngeal parts as well as at the time of excision of the neoplasm; for this reason a more radical operation may be performed because the operator is better able to see what he is doing.

4. Laryngostomy:—Sargnon, who introduced this operation into our country, performs it systematically at least, upon the adult, under local anesthesia, as does Prof. Sieur. The technic of these operators is very similar to that just described for laryngo-fissure. Previous anesthesia of the surface of the isthmus of the thyroid and the laryngeal cavity through the natural channel, intradermal and subdermal infiltration along the median line of the trachea. After the laryngeal cavity has been opened a strip of gauze saturated with a strong solution of cocain-adrenalin is introduced into its interior and left in position for several minutes. I assisted at an operation performed by Sieur, who employed this technic, and I appreciate the complete analgesia obtained by it.

5. Laryngectomy:—Laryngectomy since its inception has been considered one of the most rash surgical procedures whose first statistics were almost discouraging. Gradually these results have become more favorable, due to the progressive improvement in its technic towards which Perier, Lebec, Ceci, and, above all, Glueck, largely contributed. The men feel that the elimination of general anesthesia has contributed towards lessening the mortality resulting from the operation in question.

In the last two cases of laryngeal epithelioma in which I saw laryngectomy applied I unquestionably attribute the fatal result to chloroform-narcosis: in the first case the anesthetizing liquid found its way into the trachea; in the second case the wound was probably infected by the rubber tube used to anesthetize the patient, which was expelled several times and replaced without sufficient sterilization; in both cases death was due to bronchial pneumonia. It may be urged that the method used in these two cases must not be held responsible for the grave faults committed.

Yet my observations lead me to the conclusion that if local anesthesia can be substituted in these cases, it ought to be employed, as has been demonstrated clinically by Ceci, Botey, Tapia, Moure, and by Berard assisted by Sargnon.

Prof. Ceci deserves credit for being the first one to apply this important innovation^o. In the case of a man of 54 years, with intrinsic laryngeal cancer (flat-celled epithelioma), complicated with bilateral,

cervical ganglion infiltration (an urgent tracheotomy had been previously made and an exploratory laryngotomy under local anesthesia), extirpation of the larynx was made (February 25, 1904) with local anesthesia of a solution of cocain ($\frac{1}{2}$ per cent) and antipyrin (3 per cent). The infected ganglia were removed during the course of the operation. The patient recovered and could make himself understood at several meters' distant by means of pharyngeal voice mechanism.

A second operation of the same kind was undertaken on August 6, 1904, on a man of 63 years. In this case the trachea was opened and, following the special technic of the author, the edges were sutured in a button-hole incision in the sub-sternal space. The patient succumbed the twelfth day, due to a progressive cardiac weakness, complicated with pulmonary edema. The year following, on March 9, Ceci performed the same operation, followed by the death of the patient on the fifteenth day, due to bronchial pneumonia. Our Italian colleague was more fortunate in the fourth operation, on a woman of 57 years, suffering from ulcerated carcinoma of the right aryteno-epiglottic fold, with enlargement of the carotid and sub-clavicular ganglions of that side. One month after the extirpation of the larynx, a second operation was performed under local anesthesia for removal of the cervical ganglions, which could not be done at the first operation, and a further operation to reconstruct the pharyngeal wall by means of cutaneous flaps.

In a letter dated September 20, 1911, Prof. Ceci reports a fifth case of laryngectomy, executed like the preceding under local anesthesia, with favorable results; like the first patient mentioned, by means of the pharyngeal voice, this case was able to make himself heard at a distance of several meters.

In a letter dated June 8, Moure writes: "I have recently done a total laryngectomy under cocain anesthesia. Two first injections were made at the level of the entrance of the superior laryngeal nerve, besides which deep and superficial injections were made along the median line (line of incision), because I did not make a 'T'-shaped incision. There was no complaint of pain on the part of the patient. The operation proceeded regularly and normally, and I may say that it was particularly simple. The patient is convalescing (it is almost three weeks since the operation) and may be considered cured by first intention; there was only a small secondary fistula in the esophago-pharyngeal region, which I sutured to the hyoid region." Berard and Sargnon performed two laryngectomies under lo-

cal anesthesia in 1911, which were reported at the surgical society of Lyons. In both cases the operation was done in two stages, an interval of fifteen days elapsing between the low tracheotomy and the extirpation of the larynx. In both cases the operation for tracheotomy, as well as for the extirpation of the larynx, was performed by intradermal and subcutaneous infiltration; in the second case local infiltration of the two superior laryngeal nerves was practiced.

Sargnon attributes to the absence of this step in the first case, the fact that some pain was experienced by the patient during the disengaging of the posterior wall of the larynx. The second case experienced no pain. Sargnon adds that the two operations were as bloodless as an amphitheatre dissection and that there was no shock from the operation. The first patient was younger, more vigorous and was out several days after the operation, while the second one, older and feebler, suffered from purulent bronchitis with fever after the tracheotomy, but had no bronchial pneumonia.

Sargnon is of the opinion that local anesthesia for laryngectomy is particularly indicated in enfeebled patients, subject to bronchitis, permitting slow dissection under perfect hemotasis, allowing the patient the possibility of clearing the bronchi during the operation, thereby avoiding bronchial pneumonia and shock. Tapia had applied local anesthesia only to tracheotomy performed fifteen days before the extirpation of the larynx. In June, 1911, he applied local anesthesia to the second and principal step of the operation in a diabetic patient, who had a special intolerance for chloroform. Intradermal and subdermal infiltration was combined with swabbing of the parts incised during the operation with a strong cocain solution. He was not able to suppress all pain, for he had not infiltrated the superior laryngeal nerve. This was a particularly unfavorable case of diffuse epithelioma and the operation of two hours was extremely laborious. On the other hand, the immediate results were excellent and much simpler than those in the case just previously operated upon, which caused the operator to express his intention of using this method upon the next occasion.

Botey's case was very instructive. It was one of advanced epithelioma in a man of 42, beginning on the right side, then invading the epiglottis on the opposite side and complicated by infiltration of the ganglion in the angle of the jaw.

The operation took place in March, 1911, in two stages, separated by an interval of three weeks, in which local anesthesia was employed

each time. Infiltration anesthesia was reinforced by swabbing the soft tissues by means of a strong solution during the course of the operation. The laryngectomy was the more difficult because of a severe venous hemorrhage which accompanied the removal of the affected ganglions. The operation required almost three hours and was followed by a certain degree of collapse which disappeared the same evening. The patient claimed not to have felt the least pain, and in reality the patient remained as quiet as though the operator had been working upon the cadaver. Eight days later he was able to be up. From these facts the author draws the following conclusions: "This case demonstrates the possibility of total extirpation of the larynx without suffering by means of local anesthesia; the latter is of enormous advantage because it precludes the greatest inconvenience resulting from chloroform in interventions upon the larynx, namely, respiratory syncope, which may prove fatal during the operation. Since local anesthesia does not preclude consciousness, the patient's eyes should be covered; in this way total or nearly total insensibility is realized, especially if the tissues are frequently swabbed with a strong solution. By performing laryngectomy in two stages, bronchial pulmonary infection is certainly avoided; but this method does not preclude collapse, against which we are not well fortified in spite of serum injections and other agents, because the larynx is a very unusual organ, whose sensibility makes it a center of inhibitory bulbar reflexes whose effects upon life are very marked. Has not Claude Bernard demonstrated that injury of the superior laryngeal nerve may paralyze respiration in the same manner as cutting the bulb?

6. Deep Operations in the Cervical Region: Sargnon has mentioned to me several cases of deep-seated phlegmon of the neck operated without pain, under local anesthesia, as well as a case of ligation of the jugular, and expresses the plausible opinion that the same method may be applied in Ludwig's angina in pharyngotomy and external esophagotomy. In all these interventions the cutaneous incision is, in many instances, the most painful step.

It is always possible in these operation, as well as in those just previously considered, to complete the dermal and subdermal infiltration by swabbing the tissues during the course of the operation with a strong cocain solution.

7. Removal of Goiter—It is a well-known fact that to Prof. Ceci belongs the priority of this procedure, for since the year 1891 he has removed goiter under local anesthesia. After a visit to Ceci,

Kocher decided to follow the example of his Italian confrere. Navratil adopted the same procedure, using a solution of novocain ($\frac{1}{4}$ or $\frac{1}{2}$ -100) for infiltration. Moure has also successfully employed local anesthesia in extirpation of a deep goiter, accompanied by serious symptoms of syncope.

As I have previously stated, Goris* prefers alypin as an anesthetic agent in all deep-seated operations on the neck, because it does not have the depressing heart action of cocain. He uses a one per cent solution, to which he adds a few drops of adrenalin solution (1-1000), never increasing the dose beyond three centigrams of alypin. He claims that the only painful step in cases of deep goiter is the introduction of the hand into the cavity and he believes in distracting the patient at that time by talking with him.

In order to lessen the pain attending the removal of diffuse goiter, Piquand recommends, after the thyroid body has been exposed, a deep anesthetic injection at the level of each vasculo-nerve pedicle which supplies the superior and inferior lobes of the thyroid body; the injection spreads around the thyroid nerve and produces local anesthesia of the entire thyroid body and its aponeurosis.

D. Auricular Region.

1. Auditory Canal.—The two principal conditions which demand anesthesia in the membranous canal are furunculosis and plastic operations upon its walls after mastoid operation.

Von Eicken, in 1904, proposed local anesthesia of the auditory canal by means of two injections directed toward the two nerve trunks controlling the sensibility of the auditory canal: the auricular branch of the pneumo-gastric and the auricular filaments of the auricular temporal, a branch of the superior maxillary nerve.

The course and distribution of the nerves in question are as follows: The first, after branching off from the superior ganglion of the vagus immediately reunites with the anastomosed branch supplied by the facial nerve with the vagus, it passes like the facial from within outward in front of the jugular vein and, joined with it, enters a small bony canal which leads to the aqueduct of Fallopii. There it anastomoses with the facial and penetrates into the depths of the mastoid process, to terminate finally in three filaments of which two are distributed upon the tegument of the superior wall of the auditory canal, while the third goes to the tympanic membrane.

The course of the auricular branches of the auricular temporal is much simpler: it branches from this nerve at the condyle of the jaw and supplies the skin of the auditory canal and the anterior part of the auricle.

I quote from Von Eicken: "It is necessary to reach the auricular branch of the vagus and the branches which the auricular temporal nerve supplies to the auditory canal. Both these reach the conduit at the union of its cartilaginous and bony parts and both are accessible to injection if the needle is introduced at a point situated on the posterior fold of the auricle, at about the height of the floor of the bony canal. For injection of the auricular branch of the vagus, the needle must be plunged upward and backward against the tympanomastoid fissure; to anesthetize the auricular filaments of the auricular-temporal, the needle, while the mouth of the patient is open, is drawn somewhat backward, and penetrates inward and somewhat forward along the anterior wall of the canal to a depth of about one centimeter and a half in the adult, and less in the child, proportionate to its age." I acknowledge the ingeniousness of this method, founded upon exact anatomic relations, but I must admit that I do not see its advantages as compared with direct infiltration, which can be done as easily in the auditory canal, even when it is the seat of one or more furuncles. I have never found the least difficulty in applying it painlessly when the following three simple precautions were observed: I lightly swab for several moments with Bonain solution the point or points which I intend to incise; I do not apply the point of the needle to the acuminate point of the furuncle, which is sensible to the slightest pressure, but to the outside limitation of the infiltration of the furuncle; while slowly injecting several drops of the anesthetic solution a pallid zone is seen to take the place of the redness; two minutes later the furuncle may be deeply and crucially incised without the least pain.

2. Ossiculectomy—For several years I have employed this method exclusively, even in children, with uniformly satisfactory results, as far as the absence of pain and bleeding, so annoying in the absence of adrenalin, are concerned.

I advise ossiculectomy only in cases of suppuration; consequently there is always a tympanic perforation through which I am able to come in contact directly with the internal surface of the middle ear. I first pass a small tampon of cotton impregnated with Bonain solution through the perforation. If there is a perforation of Schrapnell's membrane I pass the tampon into the attic; infiltration is done by means of a small syringe with cannula needle at an obtuse angle in order that the view may not be obstructed. After swabbing the region corresponding to the tegument with Bonain solution, in order to make the prick of the needle less painful, the needle is applied, not against the tympanum (at this level the skin is very thin

and adherent and would break at any attempted injection), but about 1 cm. distant from it, at the union of the bony and membranous portions, recognizable by a slight circular fold of the skin and by the difference in color of this from the other portion, and at the level of the conjunction of the superior and posterior walls. After having planted the point of the needle obliquely at this level, the injection is slowly made; a half cubic centimeter suffices amply and one can see a slight pale bleb which gradually extends to the superior part of the tympanic membrane; this action indicates that the desired result has been obtained, often the excess of injected solution escapes through the perforation. The technic of infiltration is easily understood in such cases: the fluid injected in contact with the bony wall of the bony canal finds its way, when raising the periotum, as far as the fissure of Rivinus, at which level a large part of it penetrates into the attic, while the surplus runs into the lower part of the tympanic cavity. After ten minutes the tampon which had been introduced through the perforation may be withdrawn and the operation may proceed.

3. Simple Antrotomy: In 1894 I operated upon a case of acute mastoiditis for Prof. Reclus under local anesthesia. Prof. Reclus assisted at the operation and performed the analgesic infiltration. The operation was most satisfactory and the patient experienced no pain. It was due to this that I began the application of local anesthesia in our special surgery whenever practicable. Since then I have several times easily performed antrotomy under the same conditions and with varying results, as far as the analgesia was concerned, due to the varying topography of the lesions, which vary with each particular case.

My conclusion is that if local anesthesia is applied in acute suppurative mastoiditis as it may often be in such cases as the preceding ones, it must nevertheless be considered the exceptional method reserved for special cases, because in our specialty there is no operation which holds in store greater surprises for the operator than this one, and often the previously prepared anesthetized field must be secondarily enlarged during the progress of the operation. As long as the suppuration is intra-osseous and not complicated by diffuse otitis, the technic is simple, but the technic becomes more difficult when the softer tissues exteriorly have been involved, and it presents the maximum of difficulty when there are distant purulent fistulas involving the muscles and deep tissues of the neck.

In all these cases intradermal infiltration is begun along the projected line of retro-auricular incision. If there is no exterior in-

volvement the intradermal injections are followed by injections made in contact with the bone, in order to produce a deep infiltration corresponding with the surface of the intended osseous resection, and for the reason indicated above it is wise to extend this area rather than to limit it just to the most necessary dimensions. An injection of a certain quantity of a weak solution should be made just under the point of the bony process in order to facilitate its possible resection. In cases of exterior involvement, deep injections, should be made along the entire limit because of sharp pain which always accompanies curettement. One should also be prepared to pack the subcutaneous abscess cavity with a strip of gauze saturated with Bonain solution, which should be left in place for several minutes, in the hope of obtaining osseous anesthesia of the bone. If it be necessary to pass beyond the limit of the first anesthesia during the course of the operation, a supplementary intradermal infiltration should be made, as well as an injection in contact with the bone, in the direction along the line of further intervention.

I have noticed that it is particularly in those cases wherein we wish to avoid the dangers of general anesthesia that we find the annoying tendency of purulent fistulas under the teguments and deep under the muscles. Both conditions are unfavorable for the use of local anesthesia. I speak of diabetics. In very stout persons the abundance of fat and the inflammatory infiltration make the borders of the wound unusually thick, causing their curettement, as well as the osseous resection to become extremely laborious. In spite of these difficulties we shall succeed if the free incisions are sufficiently long and well executed at the point of the preliminary intradermal infiltration. Two years ago I was able to remove from an old diabetic patient the accumulation of pus in the mastoid, then a large collection occupying the intermuscular spaces of the neck as far as the occipital. In another extremely adipose diabetic with periauricular tissues much infiltrated, I recently entirely removed the intra-osseous pus, which extended abnormally in a sort of tunnel, resulting from the breaking down of the supra-meatal cells. One hour after the operation the patient was able to go to his home. A large number of my French and foreign colleagues follow the same method. Moure systematically employs local anesthesia for antrotomy in old and weakened patients, especially in cases of diabetes and albuminuria. Sieur made his first attempts with local anesthesia in special surgery in cases of acute mastoiditis and the results were sufficiently satisfactory to cause him, during the last ten years, to usually renounce general anesthesia in such cases.

Leutert has frequently performed antrotomy under local anesthesia and only abstains from it in children under 4 years. The analgesia has usually been quite sufficient, except in cases of mastoid neuralgia where there is no suppuration.

Sargnon reports that on October 5, 1911, he operated under local anesthesia upon an infant of 3 months whose mother was tubercular; the little patient suffered from purulent otitis complicated with facial paralysis and mastoiditis. The general condition of the patient was very bad, which led to the use of local anesthesia; he injected 1 ccm. of strong Schleich solution made as follows: Chlorhydrate of cocain, 0 gr. 20; chlorhydrate of morphin, 0 gr. 025; chlorure of sodium, 0 gr. 20; distilled water, Q. S. to make 100 gr.; aq. phenol, (5 per cent) 2 to 3 drops. The operation was simple and the patient complained no more than before the operation, and several days later its condition was all that could be expected. Sargnon was of the opinion that the child would scarcely have borne general anesthesia.

4. Mastoid Curettement: Two years ago Dr. Guisez and I performed the operation in question upon a diabetic under local anesthesia. After passing a tampon of cotton saturated with Bonain solution through the tympanic perforation into the tympanic cavity a retro-auricular, intra- and subdermal infiltration was done as it is in simple antrotomy; the auricle was drawn outward and a deep injection made between it and the anterior border of the apophysis, toward the posterior wall of the bony canal, in order to render painless the detachment of its cutaneous periosteal lining; then a dermal infiltration of the postero-superior wall of the membranous canal and of the concha was made for a Siebenmann plastic. The patient stood the operation well; there was very little bleeding. Last October my colleague, Jacque Fournier, performed the same operation under simple local anesthesia upon two patients of advanced age who wished to avoid general anesthesia. He also packed the tympanic cavity with a cotton tampon saturated with Bonain solution. It is probable that if Leutert, who performed the same operation several times under local anesthesia, had applied this latter step, he would have avoided the pain which his patients experienced during the curettement of the tympanic cavity and when cutting away the inter-tympanic-antral spur.

APPENDIX.

Intra-cranial Operations: Often no anesthesia is employed, especially in searching for a brain abscess in a patient approaching a state of coma; but this is not always the case, and I call attention

to those dangers specially inherent in the use of chloroform upon patients with increased intra-cranial tension due to intra- or extradural encephalic suppuration, especially when the lesion is situated in the posterior part of the cranium in the region of the bulb. The patient is then exposed to syncope or respiratory interruption, which frequently results in death upon the operating table.

In patients who still possess a certain degree of consciousness and sensibility, nothing seems more clearly indicated, in order to avoid both pain and the dangers of narcosis, than to employ dermal and subdermal infiltration anesthesia in those parts where osseous resection will be undertaken.

D. RESUME AND CONCLUSIONS.

I shall be happy if by means of the preceding considerations I have been able to establish the fundamental conclusion that in our special surgery, as well as elsewhere, local anesthesia should be preferred to narcosis wherever it is possible and where the patient does not oppose it. If the latter were the only obstacle, we must still influence our patient to accept it, for no matter what the age or condition of the patient may be, general anesthesia always implies a certain contingency which it is impossible to recognize in advance. With local anesthesia we may speak most reassuringly in the majority of cases; by the removal of the possibility of accident during general narcosis, the operator feels a calmness which cannot help but be favorable for the successful execution of the operation. The patient who is more or less impressionable while waiting for the operation, is in a nervous state, annoying to himself and the operator. In the great majority of cases 1 ccm. of morphin injected one hour in advance is sufficient to make of this nervous subject a calm, semi-somnolent being, robbed of his fears, but with sufficient consciousness to be of assistance to the operator.

I wish to recall the inappreciable advantages resulting from the combination of adrenalin with the anesthetic agent, especially in submucous resection of the cartilage of the septum, in radical maxillary operation, for the operations upon the vascular surfaces, for ossiculectomy and, above all, for tracheotomy and laryngo-fissure, all operations in which bleeding was formerly so annoying, without ever taking into consideration the useless weakening of the patient.

Upon operations of the respiratory passages the benefit of this ischemia is double, because it prevents the penetration of blood into the air passages and the complications of bronchial pneumonia, which

frequently results; granted that the ischemia may not be complete and that some blood may flow into the trachea instead of having before us an inert, passive subject we have the conscious patient, capable of changing his position, expectorating, blowing the nose—in a word, to become an aid, in a certain sense, in the post-operative treatment which is often so difficult in the unconscious patient.

After chloroform anesthesia the patient is weakened for several hours, nauseated and vomiting; dietary precautions must be taken for several days and the patient remain quiet. On the other hand, when operated under local anesthesia the whole question of hospital detention for the patient is minimized and he is able to attend to his usual vocation without further delay. In brief, the employment of local anesthesia minimizes the responsibilities of the operation, and simplifies the operation; the patient is spared much unnecessary discomfort, hospital services and loss of time. This is the balance sheet of local anesthesia when considered in reference to oto-rhino-laryngologic surgery.*

*This report was terminated before I learned of the work presented by our colleague Broeckaert at the last Congress of the Belgian Society for Oto-rhino-laryngology under the title "Technic of Regional Anesthesia in Rhino-laryngology," published in Vol. 2, 1911, *La Presse Oto-laryngologique Belge*. In consequence I was not able to use the article in the preparation of this paper and I should advise my readers to consult it as comparative and complementary reading.

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MALIGNANT TUMORS OF THE TONSIL*

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Data concerning the anatomy, histology, and embryology of the tonsil have been so thoroughly discussed in almost numberless textbooks and special papers and are so well known that it seems unnecessary to review them in this discussion. The physiology of the tonsil is a most pertinent subject in dealing with the pathologic condition to which it is liable, but because of the above-mentioned reasons, this phase of the subject is also omitted.

Etiology—The tonsils occupy a portion of the embryonic zone in which the hypoblast, extending upward from the intestinal tract, meets the epiblast, pouching in to form the cavity of the mouth. They arise by a complex and protracted series of processes, and contain elements of epiblastic, hypoblastic, and mesoblastic origin in relations that would seem to predispose to irregular and atypical cell development.

Their location in the fauces is such that they are subject to constant motion, to attrition, and chemical irritation by all that enters the mouth and passes down the pharynx, and to infections from many internal and external sources.

Although these and other factors would seem to have a tendency to make it a favorable site for malignant neoplasms, it is true that tumors of the tonsil are among the comparatively rare clinical conditions. This immunity may be due in part to the fact that the function of the tonsils is fulfilled before puberty, and, before the age at which malignant growths are apt to occur, they have lost most of their blood-supply, undergone retrogressive changes, and become atrophied masses of inert tissue. However, in the case of many individuals having hypertrophied tonsils, there is a second period of morbid activity after the age of forty, and it is during this period of life, and usually in this type of cases, that sarcomata as well as carcinomata are most frequently seen.

Several cases collected from the literature and at least four out of the twenty-two in my own series give a history of one or more severe attacks of tonsillitis, followed by persistent swelling and then by increase in size of the tonsil. This is especially conspicuous in Case 17, having symmetric sarcomatous involvement of both tonsils in which a severe bilateral quinsy preceded and apparently caused

*Read at the meeting of the American Laryngological, Rhinological and Otological Society, May 15, 1912.

the tumor formation. It seems certain, therefore, that chronic or recurring inflammatory processes are important etiologic factors in determining malignant growths in the tonsil, sarcomatous degeneration following inflammations directly and carcinomatous through the inclusion of epithelium in ulcers.

This condition occurs more frequently in males than in females, possibly owing to the different conditions of life by reason of which men are exposed more frequently and constantly to irritations of the mouth, nose, and throat. But, on the other hand, women are more subject to the late attacks of tonsillitis which have already been noted as the probable causes of some cases of malignant degeneration. Therefore, as regards the matter of sex, it may simply be stated that men are much more subject to cancerous involvement of the tonsils, as they are to malignancy of all the organs of the head and neck, regardless of habits of life, etc.

Several cases have been reported in which a malignant tumor had arisen from a gummatous swelling or ulcer, indicating that in the tonsil, as in other organs, syphilis is not an infrequent source of malignancy, usually carcinomatous, and probably originating by means of infoldings of epithelium by the scar tissue of chronically ulcerated gummata.

Pathology—Sarcoma of the tonsil is similar to that of other organs, though it is apparently somewhat more apt to take the mixed-celled type. Thus in the eleven cases which I report herewith, all but one of the tumors were composed of small to large round-cells and spindle-cells, with a preponderance of small round-cells, few giant-cells, and but a small amount of connective tissue. None of this series except Case 16 could properly be called lymphosarcoma. Sarcomata of the tonsils usually have the appearance of being encapsulated, in many instances the capsule of the tonsil serving also as capsule of the tumor. This is, however, more apparent than actual, since complete and clean removal of the tumor in its capsule invariably leaves tumor tissue, which immediately resumes active proliferation. One respect in which sarcoma of the tonsil differs from that of other organs is that it metastasizes through the lymphatics after the manner of carcinoma. By reason of the similarity of small round-celled sarcoma to inflammatory tonsil tissue it is sometimes difficult to make a microscopic diagnosis between the two, so that the chief reliance in these cases must be placed upon clinical signs and symptoms.

Carinoma of the tonsil is usually of the epitheliomatous type, the cells being large, flat, and in every way similar to epithelioma

in other regions. By reason of the free lymphatic drainage of the tonsils, malignant disease of this organ forms early metastasis in the cervical glands, but yet it does not become generalized as soon as might be expected.

Symptomatology—Pain is usually the first symptom in carcinoma of the tonsil, and results from ulceration, which occurs, on the average, much earlier in carcinoma than in sarcoma. In fact, sarcomata of the tonsil are apt to attain considerable size without ulceration or pain, and attract attention merely by the presence of a large mass in the pharynx. In either case dysphagia is an early symptom, and by reason of this and toxemia of the malignant growth cachexia soon appears and rapidly becomes marked. Partly on account of the difficulty in swallowing, but more by the increased blood-supply to the mucous membrane, salivation is usually pronounced and very annoying. This secretion has a distinctive odor, and, after ulceration takes place, becomes very foul and offensive.

Hemorrhage often occurs late in the disease, but sometimes appears early and among the first noticeable signs. In several of my own cases, and in others of the collected cases, enlargement of the cervical glands has been the first symptom to attract attention to the presence of a pathologic condition of the tonsil. Children having sarcoma of the tonsil are apt to ignore its presence and slight attending symptoms until the rapid change of voice attracts the attention of parents or physician.

Diagnosis—The diagnosis of malignancy of the tonsil presents few difficulties. The fact that a tonsil is the seat of a non-inflammatory enlargement in adult life immediately suggests the possibility of malignant disease.

Post-tonsillar tumor or swelling may force the tonsil into prominence and simulate an increase in size, but careful inspection will settle this point.

Benign neoplasms of the tonsil are exceedingly rare, and present such marked differences to malignant ones that they could scarcely be confused with them. Syphilitic gumma of the tonsil may resemble either carcinoma or sarcoma, but the deep excavation, purulent surface, and purple areola should distinguish it at once from the raised cauliflower ulcer with cleaner and whiter surface and pale edematous areola of carcinoma. Sarcoma is less apt than either to ulcerate deeply, and so presents a much larger tumor with large blood-vessels showing through the mucous membrane. Fortunately,

however, in even those cases which present such signs that an error in diagnosis might reasonably be made, we can determine the nature of the morbid process without delay by the Wassermann test or by microscopic examination of a specimen which can be removed with little discomfort and no danger to the patient. Differential diagnosis of sarcoma and carcinoma is usually made without difficulty, but is not of great importance, since the prognosis and treatment are nearly or quite identical.

Prognosis—By the means now at our disposal the cure of malignant disease of the tonsils is effected in only a small percentage of cases, and the operative procedures which promise most chance of cure are so extensive as to be attended by considerable mortality. Consequently the prognosis in these cases is among the worst for any operative procedure.

Treatment—Carcinoma and sarcoma of the tonsil are so similar in their manner of growth and metastasis, and indications for their treatment so nearly identical that, in reviewing therapeutic measures, they may well be considered together. When the etiology of either is discovered, the treatment of each condition will become distinct, but at present little difference is made.

Schoenholzer has divided the life of malignant tumors before operation into three periods: During the first period the presence and growth of the tumor are unknown to the host; the second period is the time during which the patient delays before consulting a physician; and the third period is the time the physician consumes in making a diagnosis and determining a method of treatment.

The first period is beyond the control of the physician, and even of the patient himself; it is usually short in the case of carcinoma of the tonsil, since the ulceration and pain which frequently occur very early soon attract attention. The onset of sarcoma is more insidious, there frequently being no symptom until the growth causes inconvenience because of its size. For the same reasons the patient with carcinoma will consult his physician promptly in order to be relieved from suffering, while the sarcoma is often left to grow to a surprising size.

Education of the public as to the efficacy of treatment and necessity for prompt attention to tumor growths of any sort will do much to shorten the second period.

The third period is almost entirely under the control of the physician, and should be made as short as possible. In fact, the early recognition of malignant involvement of the tonsils is of prime im-

portance, since the condition is one having an extremely bad prognosis in any event; delay in treatment very soon makes it hopeless in many instances.

The rule has often been laid down that every doubtful tumor should be considered malignant until proved innocent. Certainly it is especially true of tumors of the tonsil that positive proof should be obtained at once, since their removal is attended by no danger and leaves no disability, and, beside the possibility of malignancy, there is a positive indication for the removal of any enlarged tonsil. In case the involvement be too extensive for removal when first seen, a specimen of the growth should be removed and examined microscopically by the modern methods of frozen section, so that immediate operation may be determined and performed if so indicated.

Treatment may be made with either one of two objects in view, radical cure or palliation, as the age of the patient and nature and extent of the growth may indicate. A study of the reported cases of sarcoma in children indicates that radical treatment is of little avail, and, in fact, is usually detrimental. Therefore, palliation alone remains a possible source of relief. The same is true of rapidly extending growths in adults or those having already extensive involvement or evidences of distant metastasis.

With a view to radical cure the weight of evidence at the present time is in favor of surgical removal of the growth in all cases in which the limits of involvement will permit complete excision or destruction.

Tonsillotomy or tonsillectomy alone offers little prospect of cure, as in twenty cases of sarcoma and three of carcinoma, most of them presumably comparatively early and favorable cases, there was not a single one which was reported to have lived two years without recurrence, and but three—all sarcomata—are reported to have been without recurrence at periods between six months and one year. One case of sarcoma suffered recurrence after one year.

The addition of cautery to tonsillectomy increases markedly the efficacy of the operations. In fifteen cases recorded in the literature there was reported one case of carcinoma still free from recurrence after three years. Indeed, the longest reported survival after an operation for malignancy of the tonsil is that of Jacobson, whose patient, operated by tonsillectomy and cautery, was alive and without recurrence eleven years after. By various other operations through the mouth, most of them by aid of splitting the cheek to

gain better access, there was not a single case reported to have reached two years without recurrence. This is undoubtedly a more thorough procedure than the foregoing, and its failure to furnish so good a proportion of cures is probably due to the fact that only early cases of limited involvement would be operated by simple tonsillectomy, while those more extensive growths, subjected to split cheek operation, would, from their nature, have a much less favorable prognosis under any form of operation.

Ligation of the common carotids for the purpose of starving the growth has been practiced in several cases and is strongly advocated by Dawbarn and others. He reports and quotes six cases in which the ligation of both carotids was made, and in some of which the efficiency of the procedure was increased by the injection of paraffin into the artery of the affected side, completely to cut off collateral circulation. Two of these were possible cures, but since these patients died of other causes at four and fourteen months, respectively, they cannot be wholly accepted as cures. This procedure should, in the opinion of those who have used it, be given further trial, as it seems to offer possibilities of cure especially in cases so extensively involved that operation could not be expected to remove all of the involved tissue.

The most radical and probably the most efficient operation is, by lateral or external pharyngotomy. Cheever, Mikulicz, Czerny, and others have devised operations, the object of which is to give access to the pharynx from the side and to permit free inspection and manipulation. By this operation it is possible to remove the entire pharyngeal growth in a block with the cervical glands which may or may not show involvement. A preliminary tracheotomy is usually considered to give freedom from aspiration of blood into the lungs while operating, but Watson-Cheyne, DaCosta, and others advocate the use of the Trendelenburg position to avoid the necessity of making another wound, which is certain to become septic. This is a formidable operation, and furnishes a considerable operative mortality, but despite the fact that it has been used in at least as unfavorable a series of cases, it gives a much better average of cures than the Kuester method through the split cheek. Thus, while in thirty-five reported cases there were four deaths as the result of operation and thirteen others who died under six months, there were, on the other hand, two without recurrence after six months, two after one year, and four after two years.

X-ray has been used in many cases, and in some has caused a temporary decrease in the size of the growth, but in none has a

SARCOMA

| LAST REPORT. | Died result of operation | Under 6 mos. | 6 mos. to 1 yr. | 1 yr. to 2 yrs. | 2 yrs. to 3 yrs. | Over 3 yrs. | No Report or Result |
|--------------------------------|--------------------------|--------------|-----------------|-----------------|------------------|-------------|---------------------|
| Tonsillectomy or tonsillotomy: | | | | | | | |
| With recurrence | 0 | 10 | 1 | 1 | 0 | 0 | 3 |
| Without recurrence | 0 | 0 | 3 | 0 | 0 | 0 | 2 |
| Tonsillectomy and cautery: | | | | | | | |
| With recurrence | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| Without recurrence | 0 | 0 | 1 | 0 | 1 | 1 | 3 |
| Excision through mouth: | | | | | | | |
| With recurrence | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| Without recurrence | 1 | 3 | 0 | 1 | 0 | 0 | 2 |
| Ligation of carotids: | | | | | | | |
| With recurrence | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Without recurrence | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| Lateral pharyngotomy: | | | | | | | |
| With recurrence | 0 | 3 | 2 | 0 | 0 | 0 | 0 |
| Without recurrence | 4 | 1 | 2 | 2 | 4 | 0 | 4 |
| Coley's toxins: | | | | | | | |
| With recurrence | 0 | 2 | 2 | 1 | 0 | 0 | 0 |
| No operation | 0 | 5 | 3 | 0 | 1 | 0 | 2 |

| Age: | Under ten | Ten to twenty | Twenty to thirty | Thirty to forty | Forty to fifty | Fifty to sixty | Sixty to seventy | Over seventy | No ¹ given |
|----------------|-----------|---------------|------------------|-----------------|----------------|----------------|------------------|--------------|-----------------------|
| Male | 1 | 8 | 9 | 7 | 9 | 14 | 9 | 5 | 4 |
| Female | 1 | 3 | 2 | 2 | 1 | 7 | 2 | 2 | 1 |
| Not given | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

CARCINOMA

| LAST REPORT. | Died result of operation | Under 6 mos. | 6 mos. to 1 yr. | 1 yr. to 2 yrs. | 2 yrs. to 3 yrs. | Over 3 yrs. | No Report or Result |
|--|--------------------------|--------------|-----------------|-----------------|------------------|-------------|---------------------|
| Tonsillectomy or tonsillotomy: | | | | | | | |
| With recurrence | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Without recurrence | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tonsillectomy and cautery: | | | | | | | |
| With recurrence | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Without recurrence | 0 | 0 | 1 | 1 | 0 | 2 | 0 |
| Tonsillectomy and dissection of cervical glands: | | | | | | | |
| With recurrence | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Without recurrence | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Excision through mouth: | | | | | | | |
| With recurrence | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Without recurrence | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Ligation of carotids: | | | | | | | |
| With recurrence | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Without recurrence | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Lateral pharyngotomy: | | | | | | | |
| With recurrence | 0 | 6 | 1 | 0 | 2 | 0 | 1 |
| Without recurrence | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| Age: | Under forty | Forty to fifty | Fifty to sixty | Sixty to seventy |
|------------------|-------------|----------------|----------------|------------------|
| Male | 0 | 12 | 11 | 7 |
| Female | 0 | 1 | 0 | 1 |

cure of undoubted malignancy occurred. It is useful as a palliative in decreasing pain, and in some instances in checking the rapidity of growth and metastasis.

Much the same may be said as to the use of Coley's toxins. The shrinkage which they have at first produced has soon ceased, and progress of the disease has been checked only for a time, Coley's case being the only one reported as permanently cured. In a few cases marked relief from pain has been obtained by their use.

Medical treatment is useless except as a palliative, and need not be discussed here, as it consists principally of measures to keep

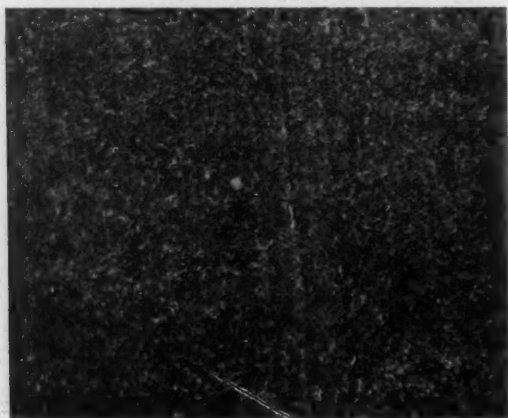


Figure 1—Case No. 8. Sarcoma of tonsil. Formaldehyde fixation hematoxylin and eosin stain 100 diam. Section shows tumor composed principally of small round cells, with some large round cells and a few spindle cells.

the region as clean as may be, and with opiates, etc., to reduce the pain.

Case 1.—Male, aged 48 years. Operation November 8, 1906. Pathologic diagnosis: Sarcoma. Prognosis bad. No later report.

Case 2.—Male, aged 48 years. Consultation April 5, 1909. Patient complained of soreness and pain in right tonsil for past six months; improved during last ten days on potassium iodid. Ulcer occupying site of right tonsillar fossa, coated whitish, edges everted. Tonsil removed April 6, 1909; block dissection of right cervical glands May 3, 1909. Cantery of recurrence at base of tongue January 5, 1910. Further course of the disease unknown, but termination

undoubtedly fatal. Pathologic diagnosis: Epithelioma of tonsil; inflammatory glands.

Case 3.—Male, aged 62 years. Consultation April 29, 1909. Patient complained of discharge from and progressive increase in size of right tonsil during past three months. There had been no pain or soreness at any time. Tonsil enlarged to size of large egg, smooth, and edematous looking. No enlargement of glands palpable. Operation May 3, 1909. Tonsil excised. Pathologic diagnosis: Sarcoma. Recurrence and death in a few months.

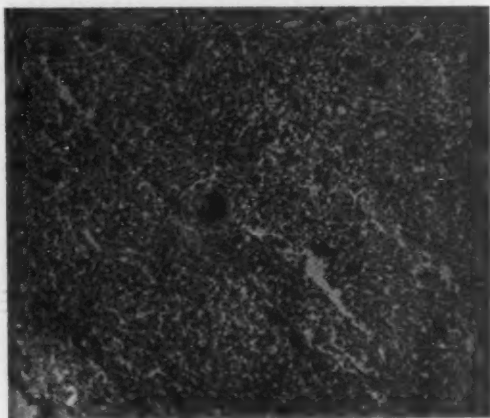


Figure 2—Case No. 4. Preparation same as Figure 1. Specimen shows a few small round cells, many large round cells and spindle cells.

Case 4.—Male, aged 51 years. Consultation, August 15, 1909. Swelling in cervical glands and tonsil for past three months. Inoperable on account of extensive glandular involvement to left cervical glands and both tonsils. Large cauliflower ulcer present. No pathologic diagnosis. Clinical diagnosis: Carcinoma.

Case 5.—Male, aged 31 years. Consultation March 16, 1909. Left tonsil had been removed three years ago for enlargement. Soon after cervical gland became enlarged, glands and tonsil growing steadily since then. March 18, 1910, removal of tonsil; excision of broken-down tumor involving cervical glands and sterno-mastoid muscle. Pathologic diagnosis: Sarcoma. Patient last seen in April, 1911, with diffuse slow-growing sarcoma of jaw and neck.

Case 6.—Male, aged 66 years. Consultation March 16, 1909. Tonsil sore and increasing in size. Left tonsil found to be swollen

and partly ulcerated; ulcer foul and sloughing; fungoid in appearance. Swelling greatly reduced by mixed treatment, though no syphilitic history. March, 1909, tonsil removed. Pathologic diagnosis: Gumma with epithelioma at top of ulcer. Healed completely on mixed treatment. March 16, 1910, recurring growth was excised and diagnosed microscopically as epithelioma. Three times since then small growths have recurred at the site of former tumor and have been removed, the last one three months ago. Glands recently have become involved, though the growths are still small and in the

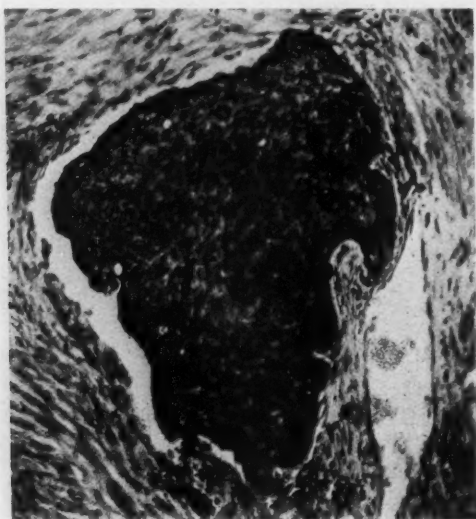


Figure 3. Carcinoma of tonsil. Case No. 2. Preparation same as Figure 1. Large, epithelial mass; cells compact; not much active mitoses, indicating slow growth.

midst of scar tissue. On account of the patient's general condition, it is not considered best to attempt radical operation.

Case 7.—Male, aged 74 years. Consultation June 29, 1910. Tonsil sore and ulcerated for more than three weeks; no glandular involvement. Typical carcinomatous ulcer with everted edges and characteristic color, firmness, etc. Operation declined. No microscopic examination.

Case 8. Male, aged 62 years. Consultation, September 9, 1910. Two months ago a small tumor was removed from the right tonsil. Tonsil has continued to increase in size. Mass now fills most of

pharynx and mouth—smooth, pale pink, and traversed by large vessels. Clinical diagnosis: Sarcoma. Tonsil was enucleated, and cervical glands were removed by block dissection. Microscopic examination of parts removed showed only inflammatory tissue. Growth in tonsillar fossa recurred promptly and was removed in four months. Recurrence again removed in three months showed microscopically no characteristic sarcomatous tissue. Specimen removed a month later showed round-cell sarcoma. Glands of neck removed at first operation diagnosed inflammatory, at last operation,

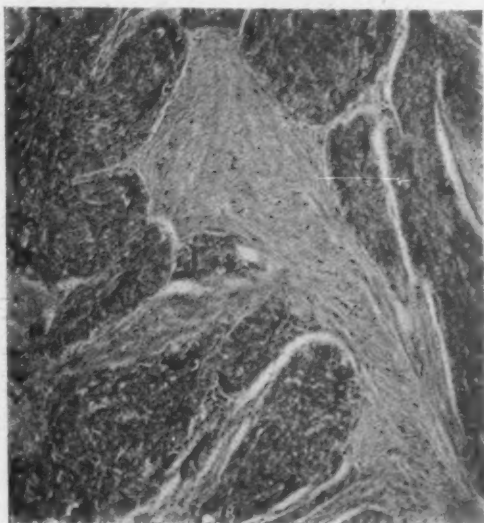


Figure 4. Carcinoma of tonsil. Case No. 6. Preparation same as Figure 1. Rapidly growing epithelioma.

sarcoma. Cachexia was marked; patient failed from the beginning, and died about one year after the first appearance of the growth.

Case 9. Female, aged 35 years. Consultation, September 12, 1910. Enlargement of right tonsil for past three months. Specimen removed two weeks ago and diagnosed lympho-sarcoma.

Operation, September 16, 1910. Tonsillectomy and block dissection of right cervical glands. Uneventful recovery. Two months later enlargement of the glands of the left side of the neck as far down as the clavicle. Blood and general examination negative. Pathologic diagnosis: Doubtful sarcoma or Hodgkin's disease; later confirmed as sarcoma.

Case 10. Male, aged 67 years. Consultation, October 13, 1910. Growth on left tonsil for several weeks. Now large ulcer with characteristic carcinomatous appearance involving tonsil and lightly soft palate. The patient refused operation. Returned one year later after several months of X-ray treatment. Growth greatly increased and extended, and cervical glands of both sides much enlarged. Inoperable. Clinical diagnosis: Carcinoma.

Case 11. Male, aged 53 years. Consultation, November 5, 1910. Throat sore for past six weeks; swelling of cervical glands four weeks. Patient has lost 30 pounds in weight during past six weeks; general health otherwise good. Large fungoid ulcer of left tonsil; cervical glands markedly enlarged and some general glandular enlargement. Bad prognosis given, but the patient insisted upon operation in the hope that progress of disease might be delayed or palliated.

November 7, 1910, tonsillectomy and cautery; block dissection of cervical glands. Pathologic examination revealed epithelioma of virulent type in all tissue and glands removed. Cachexia progressed rapidly, though local recurrence was not evident. Death occurred six weeks after the operation.

Case 12. Male, aged 64 years. Consultation, December 14, 1910. Duration and extent, two months; left tonsil and pharyngeal wall from naso-pharynx to epiglottis involved. Has severe neuralgic pain on side of head. January 14, 1911, specimen removed for microscopic examination. Pathologic diagnosis: Epithelioma. Inoperable. Died in three months.

Case 13. Female, aged 66 years. Consultation, December 19, 1910. Duration and extent, right tonsil swollen for one year; cervical glands of both sides to clavicle palpable for six months. Clinically diagnosed undoubted carcinoma. Inoperable. Later course unknown.

Case 14. Male, aged 37 years. Consultation, May 5, 1911. Tumor at right angle of jaw for twelve years following an injury; has grown very slowly, if at all. Right tonsil has been increasing in size for several—six to eight—years. Within last two years other glands of both sides of neck have begun to enlarge slowly. Clinically diagnosed as sarcoma. Refused operation or removal of tissue for diagnosis. Subsequent history unknown.

Case 15. Female, aged 70 years. Consultation, May 13, 1911. Ten years ago severe tonsillitis, and since then tonsils have remained swollen and frequently sore. Cervical glands first involved five

glands of both sides of neck have begun to enlarge slowly. sides greatly enlarged; feel edematous on palpation. General condition bad. No operation. Clinically diagnosed as sarcoma.

Case 16. Male, aged 54 years. Consultation, May 31, 1911. Painless swelling at left angle of jaw has grown steadily for past five years. Right side became involved three years ago, and at that time enlarged glands were found as far down as the clavicle. Patient has been conscious of swelling of left tonsil for a few months only; now has large tumor of left tonsil and great enlargement of complete chains of glands on both sides. Blood examination negative. Specimen removed for examination. Pathologic diagnosis: Small round-cell sarcoma. Subsequent course unknown.

Case 17. Male, aged 47 years. Consultation, June 22, 1911. Small nodule at the left angle of jaw appeared seven months ago. Ulcer of left tonsil noticed one month ago. Swallowing has been increasingly difficult for past two weeks. Ulceration of tonsil; swelling of pharyngeal wall to larynx. July 1, 1911, tonsillectomy and block dissection of the glands of the neck. Subsequent course unknown, but prognosis unfavorable on account of recent rapid growth. Pathologic diagnosis: Epithelioma.

Case 18. Male, aged 31 years. Consultation, June 28, 1911. Left tonsil began to grow rapidly a little over four months ago. Was removed four months ago and three times subsequently. Considerable obstruction, but only slight pain on swallowing. Masses of tumor slough off every few days if not removed by operation. Now has large mass of soft polypoid tumor involving left tonsil, posterior and lateral pharyngeal wall, and left arytenoid. Left cervical glands palpable to clavicle. Pathologic diagnosis: Sarcoma. No operation advised. Subsequent course unknown, but undoubtedly speedily fatal.

Case 19. Male, aged 65 years. Consultation, September 8, 1911. Left tonsil has been increasingly sore for nine months, following a bruise. Slight hemorrhage at times and much foul purulent discharge. Now has large excavated ulcer with everted cauliflower edges. Faucial pillars, lateral and posterior walls of pharynx, and base of tongue involved. Pathologic diagnosis: Epithelioma. Case evidently inoperable. Subsequent course unknown, but undoubtedly fatal.

Case 20. Male, aged 31 years. Consultation, October 18, 1911. Swelling of tonsil appeared nine months ago, and was operated elsewhere six months ago. Coley's toxins were used after recurrence

and growth decreased in size. Discontinued treatment and tumor began to grow and extend. Pathologic diagnosis: Sarcoma. Advised to return to former surgeon and continue treatment with toxin. Subsequent course unknown.

Case 21. Female, aged 44 years. Consultation, October 25, 1911. Tonsils have remained swollen and sore since a severe attack of tonsillitis six months ago. Swelling has varied somewhat, but there has been little if any increase in size during past few weeks. Tonsils are both the size of small egg, smooth, pale, but not conspicuously unlike simple hyperplasia. No glands enlarged or other signs of extension of disease. October 31, 1911, tonsillectomy. Pathologic diagnosis: Medium round-cell sarcoma. All cut surfaces were cauterized. Time is too short to indicate result, but at one month surfaces were perfectly healed, with no sign of recurrence. Blood negative.

Case 22. Male, aged 55 years. Consultation, October 30, 1911. Right tonsil sore and swollen for about two months; cervical glands enlarged for six weeks. Had tonsillotomy elsewhere two weeks ago, and treatment before and after that for tuberculosis of the throat. General condition very good and no signs of pulmonary tuberculosis. Now has sloughing fungous ulcer of tonsil involving soft palate, pillars, and pharyngeal wall to arytenoid; cervical glands of both sides greatly enlarged. Pathologic diagnosis made elsewhere—carcinoma in an inoperable stage.

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THE OPERATION OF TONSILLECTOMY AS PERFORMED IN ANCON HOSPITAL.*

BY HOWARD V. DUTROW, M. D., ANCON, CANAL ZONE.

Much has been written within the last three or four years on the technic of tonsillectomy. Each operator has a favorite instrument or two which he uses to the exclusion of all others. It is an operation that has taken its place among what is generally termed "major surgical operations." The control of hemorrhage by forceps and ligatures has displaced previous unsurgical measures. The snare has displaced the tonsillotome, for obvious reasons. It is almost impossible to do a complete operation with an instrument with a cutting-edge like the tonsillotome. The wire of the snare, if placed behind the margins of the capsule and pressure brought to bear, will pass behind the capsule, affecting its complete enucleation with the capsule intact, whereas the tonsillotome, being a cutting instrument, will penetrate the capsule, leaving a portion of it together with a certain amount of the tonsil behind. The complete removal of the tonsil in all cases should be the object of the operator, especially where a general anesthetic is given. I do not think the operator should leave a portion of the tonsil behind any more than the surgeon should leave, say, one-half of the appendix. The hemorrhage as the result of a tonsillotomy is almost as profuse as that of a tonsillectomy. In the case of an incomplete enucleation, that portion of the tonsil left behind is capable of producing the same train of symptoms as before the operation. Many authorities in times gone by held that the tonsil atrophied completely after a portion of it had been removed but this is not always true, and in the meantime it is liable to bring about the recurrence one or more times of local and constitutional disturbances for the relief of which the tonsillotomy was primarily performed. There are a number of minor operations upon the tonsil which may be performed with comparatively good results, in cases when it is not expedient to perform the radical operation and at the same time the tonsil is greatly in need of surgical treatment. I refer to the use of the actual cautery, the use of chemical cauteries, and the slitting with a knife of the lacunae with the view of producing a cicatrix, thereby obliterating the follicles.

*Read before the Sixtieth Monthly Meeting of the Canal Zone Medical Association, at Ancon Hospital, March 8, 1911.

The patient, prior to the operation of tonsillectomy, should undergo a period of preparation. It is necessarily a hospital operation, whether performed under a general or local anesthetic, requiring confinement in the hospital for a period varying from two to seven days. The patient should go to the hospital the day before, or in the case of a child with intelligent parents who will not permit the child to take any breakfast the morning of the operation, it may be performed the same morning. The history should be taken and a general physical examination made, together with an examination of the urine. Tonsils should never be excised during or immediately after an acute inflammation, such as an acute follicular tonsillitis or phlegmonous tonsillitis. One should be governed also by the condition of the pharynx and the nasal fossae, as all these conditions predispose to infection and hemorrhage. Women and girls should not be operated upon while menstruating. Special care should be taken to elicit the history of hemophilia. If such a history be given the operation should be postponed indefinitely, or, if it is urgent, a course of calcium chloride should be given for a week or ten days preceding the operation. If there is still doubt as to the coagulability of the blood its index should be ascertained. The bowels should be emptied the evening before the operation, preferably by the administration of the calomel and salts treatment. The hypodermic administration of morphia and atropia in adults and the tincture of belladonna in children, one-half hour before the operation, should always be employed to reduce the secretions during anesthesia.

GENERAL ANESTHESIA: General anesthesia should be used in young children and in nervous adults. Ether is to be preferred on account of its unquestionably greater safety over chloroform. It may be administered in many ways. Some operators use metal tubes introduced into the nostrils, while others use a single tube introduced into the corner of the mouth, still others use a soft rubber catheter through the nose, ether fumes being forced through these tubes by means of compressed air. The ordinary Esmarch's chloroform inhaler, covered with twelve to sixteen layers of gauze, is probably the safest and most efficient method of administration. Deep anesthesia is to be desired. If this is accomplished before the operation is begun, it is often possible to complete the operation without the further administration of the anesthetic. With profound anesthesia, there is greater safety for the patient, the surgeon is enabled to proceed more rapidly and with greater precision. It is to be remembered that the deep pharyngeal reflexes are among

the last to disappear. The abolition of these reflexes after the patient has become relaxed may be expedited by swabbing the tonsillar region with a 10 per cent solution of cocain. Occasionally we may have a case in which ethy-chloride may be a sufficient anesthetic, but such cases are rare. Nitrous oxide is less satisfactory. One should not use ether to the total exclusion of chloroform, especially in cases where the former is strongly contra-indicated.

LOCAL ANESTHESIA: This form of anesthesia can be used only in children above the age of 14 or 15 years and in adults who have not a hyper-sensitive throat and who can in a way control their nervous temperament. The tonsils, posterior wall of pharynx, anterior and posterior pillars and uvula are swabbed with an eight or ten per cent solution of cocain, ten or fifteen minutes before the operation is begun. The patient is usually put in a sitting position with a head rest. The anesthesia of the tonsil is further obtained by the injection into the substance of the tonsil through the anterior pillar at its upper, middle and lower confines, with a hypodermic syringe, or preferably a Pynchon tonsil syringe of a quarter of one per cent solution of cocain hydrochlorate together with four or five drops of 1 to 1000 solution of adrenalin, 3 to 5 minims being sufficient at each point. Care should be exercised to thoroughly infiltrate the tonsil down to and including its capsule. As a time-saver the other tonsil may be cocainized in the same way at the same time; thus allowing it to become thoroughly anesthetized. —Although some operators prefer to cocainize and excise one tonsil at a time. This is good practice, especially in cases of cocain idiosyncrasy or profuse hemorrhage. The anesthesia being complete, the operation is proceeded with.

TECHNIC: I shall first discuss the operation as performed under a general anesthetic. Some operators place the patient in the dorsal prone position, while others place him up in a chair. In the latter position the head is held by an assistant, who also has charge of the mouth-gag. There are a great many disadvantages to this position in that the patient is apt to become asphyxiated, the heart's action is more liable to be affected, and blood and mucus are aspirated directly into the lungs. I operate with the patient usually lying on the right side and with the head lowered fifteen or twenty degrees. This facilitates the expulsion of blood, mucus and vomitus from the mouth. The operator is seated upon a stool or chair of the proper height, in front of the patient. The light is reflected into the mouth by an electric head-mirror or by an ordinary mirror reflecting the light from a movable bracket. The mouth-gag is in-

roduced and held in position by the assistant. The tongue-depressor is placed well back upon the base of the tongue, depressing it with considerable force, while care must be exercised not to embarrass respiration. The fauces are swabbed clear of mucus. The tonsil is seized with a suitable tonsil-seizing forceps, of which there are numerous designs. The forceps best adapted are those which have three stout prongs on each shank, such as Ballenger's or Burrows'. With this kind of forceps considerable traction can be brought to bear in drawing the tonsil into the fauces without cutting through its substance. One jaw is fastened in and beneath the base of the tonsil and the other as far as possible into the supra-tonsillar fossa. By means of a knife or scissors the mucous membrane is separated from the tonsil, anteriorly, superiorly, and posteriorly. This dissection should be carried back beyond the margin of the capsule, care being taken not to injure the pillars. The tonsil is now pulled inward and forward into the fauces and inspected in order to ascertain just how much more dissection is necessary. If it is found to be pedunculated, it is ready to be snared off. A good stout snare with heavy wire is necessary, as the tonsils are often sclerosed and the fibrous tissue in and around the capsule very much thickened and often difficult to be pinched off. The snare is now placed over the handle of the seizing forceps on to the tonsil care being taken to place the wire in the line of incision and outside of the capsule, at the same time guarding the uvula and the faucial pillars from becoming engaged in the loop before it is closed. With the tonsil now enucleated, a careful inspection should be made of the tonsillar fossa to ascertain the character of the hemorrhage. This should be carefully done before an attempt is made to remove the other tonsil, also as to whether or not the enucleation has been complete. It often happens that a portion of the superior lobe is left behind. In this case it should be pulled out with forceps as far as possible and snared off in the same manner, the sole object being to remove completely from the tonsillar fossa all remnants of the tonsil and its capsule. There are numerous other methods for the complete removal of the tonsil, each operator having a technic peculiar to himself. I hold that we should all adhere to the operation with which we are most familiar, whether it be by means of a snare, ecraseur, dissection with the scalpel, or the cautery dissection. An application of a swab saturated with a 1 to 1000 solution of adrenalin, with pressure, should be made. This will in a majority of cases be sufficient to control the bleeding. The probability of cutting the internal carotid artery is very remote, in fact

it ought never to happen except in a marked anomaly in its relationship to surrounding structures. A loop of the facial is not infrequently caught in the snare. Hemorrhage from these sources should be treated as elsewhere in the body, namely, by seizing the bleeding points with forceps and the application of suitable ligatures. The patient should not be allowed to be too hastily removed from the operating room, nor be permitted to leave the hospital before the tonsillar fossae are fairly well healed. The liability to secondary hemorrhage, especially in adults, is always to be considered. I had a case of secondary hemorrhage occur in an American, 32 years of age, on the fifth day after enucleation. Usually secondary hemorrhage takes place within twelve hours after enucleation. This condition is always grave and should not be temporized with. Prompt application of the various hemostatic solutions, such a per-chloride of iron, strong solutions of silver nitrate, adrenalin and hydrogen peroxide, together with pressure, and an ice-cap to each side of the neck. The patient is placed on his side without a pillow and instructed not to talk or swallow any of the blood, but to allow it to drool from the corner of the mouth into the basin. If these measures fail to correct the hemorrhage, a thorough inspection of the throat should be made with either a general or local anesthetic and the bleeding points picked up with artery forceps and tied, or if this cannot be done the anterior and posterior pillars should be sutured together. The technic of tonsillectomy does not differ materially with local anesthesia, except that we often have the co-operation of the patient.

The records of Ancon Hospital from October, 1908, to the present time shows a total of 401 tonsillotomies and tonsillectomies; 195 of the former were performed prior to January 1, 1910. At that time tonsillotomy was totally supplanted by the more radical operation of tonsillectomy, of which 206 have been performed since that date. As far as I have been able to learn, since the American occupation there has not been a single death as a result of operations upon the tonsils. In the series of 206 tonsillectomies, we have had 5 severe hemorrhages, all of which were promptly controlled by one or more of the procedures mentioned above.

POST-OPERATIVE TREATMENT: The patient should be kept in bed from 24 to 48 hours after the operation, with an ice-cap to each side of his neck. Food during this time should be liquid or semi-solid without condiments. A gargle should be administered on the day following the operation and continued until the wound is entirely healed. We use a number of gargles, preferably dilute Do-

bell's solution or one of the dilute salicylic gargles. We have within the last two weeks instituted the application of tincture of iodine to the tonsillar fossae once or twice daily, with the view to diminishing trauma of the uvula and faucial pillars and to facilitate the healing of the wound. We have noticed a striking beneficial result in a number of instances.

Deaths have been reported as being due to staphylococcus infection, pneumonia, chloroform anesthesia, one from adrenalin poison, one from spasm of the glottis and one case from abscess of the pharynx secondary to a tonsillectomy.

In conclusion, I desire to express my appreciation of many valuable suggestions by Dr. D. F. Reeder, Chief of Clinic, Eye, Ear, Nose and Throat Department, Ancon Hospital, in the preparation of this paper.

Ancon, Canal Zone.

Non-suppurative Sinusitis. A. H. ANDREWS, *Jour of Ophthal. and Oto-Laryngol.*, March, 1912.

Of the many elements entering into the production of this disease, the one of negative air pressure is the most important. As a result of closure of the ostei, from swelling, pressure, etc., there results passive congestion, outpouring of fluid into cavity, and if this does not become infected it is all or partly absorbed, and if prolonged, connective tissue proliferation may result, and also granulation and polypoid tissue.

The treatment consists of drainage and ventilation. An angular double-edged knife may be used to incise the naso-antral wall in the middle meatus and the contents of the sinus blown out with air and a cannula. The presence of polypi usually indicate removal of middle turbinate. If not diseased or too large, it can be inflected and pushed towards the septum, and the ethmoid cell may then be removed, if necessary, with Knight's forceps. STEIN.

THE "L" INCISION IN THE SUBMUCOUS RESECTION OF THE NASAL SEPTUM.

BY EDWARD F. GARRAGHAN, M. D., CHICAGO.

Is the "L" incision or the perpendicular slit method preferable in the submucous resection of the nasal septum? Dr. A. Morgan MacWhinnie, in a recent article in this journal,* argues against the "L" incision and in favor of the perpendicular slit. It is true that the value of any operation upon the nasal septum should be "defined according to the results obtained," but I deny his contention that the best results are obtained when the perpendicular slit is used instead of the flap operation. I have found the "L" incision and the flap method preferable for the resection of any form of deflection. An apparent simplicity in the method of procedure is advocated which is really a crude conception of the task which takes no account of the anatomical complexity and endless variety in the make-up of deflections. The question is also raised why so many instruments are used by those who employ the flap method. There is no doubt but that some operations upon the septum may be well enough performed with only four or five instruments, but unexpected and unusual difficulties are sure to present themselves in even a small series of submucous resections and it is there that the man with no instruments to cope with them, fails to succeed.

An individual case may call for only four or five instruments, but conditions may arise where a reserve of others of different form will avert disaster or an incomplete result. Every instrument is not necessary for every operation, but no instrument is superfluous and every instrument will have its part to play in some form of deflection. As to the question of infection following the operation, there is far less danger in the "L" flap method than there is where the perpendicular slit is used because the "L" flap gives perfect drainage, so that there is no possibility of pent-up blood or secretions and consequent hematoma or septal abscess.

I have never seen a hematoma following a submucous resection with the "L" incision, while I have seen hematoma following the other method. In this connection I might say that there has been reported a case of abscess of the septum as the result of an infected

*The Laryngoscope, November, 1911.

hematoma following a submucous resection after the perpendicular cut method.

The layer method of packing the nose following the operation aids greatly in the prevention of hematoma. The flap method undoubtedly gives a better view of the entire deflection than the vertical incision, and to say that it is "impossible of even approaching surgical cleanliness," because of the greater area exposed, reflects more upon the operator than upon the method employed. The doctor refers to the small abdominal incision of some surgeons as an argument in favor of the small incision in the septum. The anatomical conditions are so unlike that the comparison seems, to say the least, far-fetched. The fact, however, is that modern surgery has abandoned the small abdominal incision for the larger one which gives a better view and control of the situation, hence, has followed the reasons which have led to the flap or "L" incision on the septum.

As to the time required for the operation, the doctor claims to perform a complete operation in eight minutes and never more than fifteen minutes. The question is, what does he consider a complete operation? To judge from the incomplete work of skillful operators whom I have observed using the vertical cut and who are satisfied with simply the removal of a piece of cartilage and who fail to remove the obstructing bony deformity, his work cannot be complete.

No one can do a careful, complete bony resection in eight minutes. One is tempted to ask why this awful hurry? In an abdominal operation and under a general anesthetic, time is certainly a great factor. But not so in a nasal operation. With the patient in the recumbent posture and the operation, as it is by the "L" flap method, painless and practically bloodless, the operator can easily work for one, two or three hours with no discomfort to the patient.

It is my observation that the many incomplete submucous resections with the large perforations and the sunken bridges that are frightening so many patients from having the operation done at all are the result of the fifteen-minute operation.

The great aim of certain rhinologists seems to be haste and I know that in this manner thoroughness is often sacrificed for the sake of speed. In no operation is thoroughness more important than in the submucous resection of the nasal septum. The flap operation makes for thoroughness because the deflection is properly exposed; and so work in the dark is avoided. In this connection I suggest the Kirstein light as being almost indispensable for the

proper illumination of the interior of the nose.

One should have a sufficient number of suitable instruments for the performance of a complete resection. I believe that a thorough submucous resection means the removal of all of the cartilage and bone that is causing obstruction of the nasal passages and from observation and experience I know that this is more successfully accomplished by the flap method than by means of the perpendicular slit.

Some operators fracture the vomer at the base and then leave the fractured bone in the nose. This is not a submucous resection and besides subjecting the patient to excruciating pain which is altogether unnecessary there is left behind the thickened crest of bone which continues to obstruct the naris and is a constant source of annoyance to the patient.

The submucous resection of the septum should be a painless operation and is painless when performed in a proper way and with due regard for the patient, and I believe that this is best accomplished by means of the "L" flap method with the "L" incision.

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Prominent Ears. ROBERT MORRIS, *Med. Rec.*, March 23, 1912.

The author excises practically all the fibro-cartilage of the concha, anti-helix and anti-tragus. As a preliminary step an ellipse of skin is removed from the posterior part of the ear and from the mastoid region of the scalp.

If ligation of the vessels be necessary, it is best done with catgut and a needle, rather than with the artery forceps.

To avoid blood-clot collecting beneath the thin skin of the auricle after the cartilage has been removed, one or more openings should be made for the purpose of drainage. This is a feature of prime importance in the operation. The external canal should be packed before operating to avoid blood getting into that canal. Careful pressure over the auricle must be carried out. The chief danger of the operation is a perichondritis of the cartilage remaining in the helix; the author has not seen it, but it is possible.

LEDERMAN.

THE SALPINGIAN CURETTE.*

BY SIDNEY YANKAUER, M. D., NEW YORK CITY.

In the first number of the twenty-second volume of *THE LARYNGOSCOPE*, Dr. J. A. Bacher describes some beautiful dissections of the Eustachian tube in animals and human beings, and some measurements made upon the fresh specimen and upon casts of the middle ear and tube. The accuracy of these measurements is particularly evident to me, as they correspond exactly with measurements which I made at the time I designed the salpingian curette. I was also much impressed by illustrations Numbers 25, 26, 27 and 28. Although I have not seen the original casts, the illustrations seem to me to substantiate the statement made in my article in *THE LARYNGOSCOPE* in July, 1910, that the middle ear gradually narrows from its widest part down to the isthmus, and justify the suggestion made therein, to designate its anterior part as the pre-tympanum, rather than "the bony tube."

Bacher concludes his article with the following sentence: "According to the specimens, a curette for the Eustachian tube should have a sharper curvature than those of Yankauer and of Yearsley, who uses a straight curette, in order to hug the external wall of the tube and so keep away from the thin bone of the internal wall which separates it from the carotid canal." There are three reasons why I cannot accept this conclusion even though the premises are correct.

The only alteration which Bacher makes consists of giving the distal end of the instrument a sharper curve. We may therefore first consider the effect of this change when moving the instrument within the plane of the curvature, a plane which corresponds to the flat side of the handle. When the instrument is in position in the pre-tympanum, this plane occupies an oblique position; a movement of the handle upwards and backwards will bring the head of the curette to bear upon the anterior inferior external corner of the pre-tympanum, while motion of the handle downwards and forwards brings the head to bear upon the upper posterior internal corner. By bending the instrument more sharply it becomes more difficult to reach this corner. Yet this particular motion is of special importance, for in the upper posterior internal wall of the

*Reply to Dr. Bacher's Article entitled "The Applied Anatomy of the Eustachian Tube," published in *The Laryngoscope*.

pre-tympanum lies the canal for the tensor tympani muscle, and as I hope to show in an article soon to be published, the exenteration of the tensor tympani canal is occasionally indispensable to effect the desired closure of the tube. The carotid canal passes below, behind and internal to the pre-tympanum. In order to make the head of the curette bear upon this part, the handle is raised and the instrument is rotated in the axis of the shank, by turning the anterior border of the handle downwards. Now, if the terminal two centimeters of the instrument are more sharply bent, the head will lie further from the shank, it will make a greater excursion for the same degree of rotation, more pressure will be needed on the handle to accomplish the same amount of work, and the acuity of the sensation imparted to the finger of the operator will be lessened. The bight of the sharper curve will be more likely to strike the opposite side of the pre-tympanum and, by acting as a fulcrum, transmit an undesired amount of force to the head. The entire instrument becomes more hook-like, and altogether seems more likely to injure the roof of the carotid canal than to protect it.

2. The author states that his object was to keep away from the roof of the carotid canal. In performing this operation, however, there should be no desire whatever to keep away from this region; for to effect the closure of the tube the mucous membrane must be removed from the carotid roof as well as from every other part of the circumference of the pre-tympanum. If, by changing the bend or in any other way, it were possible to construct an instrument which could not possibly be made to touch the carotid roof, such a change would defeat the object and purpose of the instrument and render it entirely useless.

3. The author's argument contains the fallacy which laboratory workers are prone to commit, of assuming that the results of laboratory experiment are an infallible guide to clinical procedure. But clinical data are of at least equal importance, and they were taken into account in this case. When I designed this instrument, I made measurements on the dry skull and on the fresh cadaver, with substantially the same result as Dr. Bacher. I then constructed probes of various curvature, within the limits shown by the laboratory measurements as permissible. These probes were then tried out on the living subject by passing them into the tubes of patients with chronic suppuration. I found that the more straight and the more curved instruments could frequently not be passed at all, on account of the irregularities of the cartilaginous canal, and its variable movability, and for other reasons, the curve which was finally selected was

the one which could be passed most easily in the largest number of patients, and which permitted the greatest freedom of movement after it had been passed down to the isthmus.

The fact that the end of the probe actually reached the isthmus was determined not only anatomically, but also clinically, in the following manner: A probe was constructed having a cup-shaped depression in the end. A bougie was then passed through the tube by means of the Eustachian catheter until its end was visible in the middle ear. The cupped probe was then placed upon the tip of the bougie, and the latter pushed back as far as possible. The measurement was then taken by the scale at the proximal end of the bougie, and compared with previously taken measurements of the location of the isthmus.

The safety of the carotid roof was guarded by giving the cutting head a large cutting angle, 60° , and by making its proximal face a plane surface at right angles to the shank, without "rake" or "set," thereby making a scraping, not a cutting, instrument.

It has been my experience that instruments and apparatus constructed with mathematical accuracy to accomplish a given end are well employed in factories where the material to be worked upon is lifeless and under absolute control. When such extremely accurate devices are employed upon living subjects we are apt to come to grief. For the variability of living structures demands a certain amount of flexibility in our surgical armamentarium, the inaccuracies of which must be counteracted by the knowledge and skill of the operator. After all, it is upon the technical skill of the surgeon that the safety of the patient eventually depends.

Treatment of Simple Catarrh of the Respiratory Passages with Bacterial Vaccines. A. PARKER HITCHENS, *Med. Rec.*, Feb. 17, 1912.

In a very practical article on the usual causes of the ordinary cold, the author states that the determining factor is a bacterial infection, due to a disturbance of vaso-motor equilibrium, and the non-resistant ability of the tissues. There is no individual organism responsible for the infection; so a mixed vaccine is recommended. This should contain those species most frequently found in the infected respiratory mucous membrane. The proportion of the mixed vaccine is given in the paper. Removal of pathological obstructions and growths must be accomplished between attacks.

LEDERMAN,

EDITORIAL DEPARTMENT

LARYNGEAL, BRONCHIAL AND ESOPHAGEAL ENDOSCOPY.

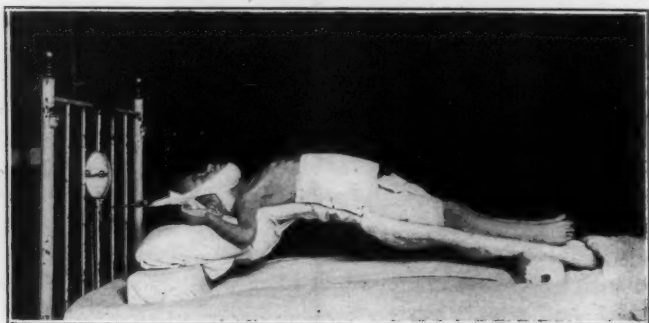
EDITED BY

CHEVALIER JACKSON, M. D.,

PITTSBURG, PA.

In adults, for diagnosis and for the removal of laryngeal neoplasms, the sitting position of the patient is preferred by most operators. For foreign-body work, gravity acting upon both foreign body and secretions, renders the recumbent position preferable in adults regardless of the matter of anesthesia. In children, most European operators prefer the upright position for locally anesthetized cases, and even for generally anesthetized cases, in some instances. The frequent use of the lateral recumbent position abroad is not fully understood by most workers in this country. Its use probably depends upon the free passive mobility of the head and neck, which, however, is just as readily obtained in the dorsally recumbent position of Boyce in which the shoulders extend slightly beyond the edge of the table and the head is out in the air supported on the left hand of the assistant. Perhaps another reason is that the relative position of the patient's anatomical landmarks is the same as in the sitting position which, with many operators, is more practiced and hence seems easier. Kirstein demonstrated many years ago the advantage of a forward position of the neck, and his very good position for direct laryngoscopy is well shown in old, forgotten illustrations. It remained for Killian to devise instruments and to develop a practical technic. The discussion of anesthesia in endoscopy is reserved for a future editorial; but it may here be said that any anesthesia, general or local, is never needed for direct laryngoscopy in children, and it is absolutely unjustifiable in infants. If an operator fails to get promptly a prolonged, clear, unobstructed view of the larynx of any child under 10 years of age without an anesthesia, general or local, his technic is faulty and the fault most likely is in the position of the patient. This does not mean that practice is not necessary; for, of course, it is. But even with the practiced, a view of the larynx is not obtained as promptly as it would

be were the proper attention paid to the position of the patient. The straight position suggested by Dr. Richard H. Johnston (*THE LARYNGOSCOPE*, December, 1910,) has not received the general recognition it deserves. This was brought forcibly to the editor's mind when examining a child from the wards of the Pittsburgh Hospital for Children. A high dorsal tuberculosis required a modified Bradford frame, as shown in the illustration. Attacks of respiratory difficulty necessitated an opinion on the condition of the larynx. Using the suggestion of Johnston, the author, without the slightest difficulty, without anesthesia, general or local, without causing the child to cry, and without changing the child's position in the frame,



Child in modified Bradford frame for high dorsal tuberculosis. Easily examined by direct laryngoscopy with out removal of apparatus.

was able promptly to exclude any anatomical obstruction in the larynx. By this, it is not meant that the larynx can always be examined without causing a child to cry; many children will cry and rebel at non-instrumental inspection of the fauces; but this case demonstrates the manner in which position facilitates endoscopy. Johnston uses the position also for starting the introduction of the bronchoscope, shifting immediately to the Boyce position, but this does not seem to offer any advantage. For its original purpose, the Johnston position is a valuable addition to direct laryngoscopic technic.

SOCIETY PROCEEDINGS.

THE PHILADELPHIA LARYNGOLOGICAL SOCIETY.

Regular Meeting, February 27, 1912.

ROSS HALL SKILLERN, M. D., PRESIDENT.

The Larynx with Special Reference to Intubation, with Demonstration on the Living and on the Cadaver. By ROYAL W. BEMIS, M. D.

Prior to the reading of this paper Dr. Bemis exhibited a patient on whom intubation had been performed for laryngeal diphtheria in 1895. The tube was introduced seventy-five times, covering a period of three months. The laryngoscopic examination showed a normal larynx. The only subjective manifestation was occasional slight hoarseness.

Dr. Bemis described the anatomy of the larynx with a fresh specimen. The history of intubation; exhibition of the original O'Dwyer tubes, and the improved set of instruments. He also dwelt upon the symptomatology of laryngeal diphtheria and membranous croup, differential diagnosis with especial reference to spasmodic laryngitis, and the high mortality in spite of intubation when the operation is postponed until an alarming condition has developed.

The essayist next described the preparation of the patient and then introduced a tube into the larynx of a young lady who kindly volunteered. The technic of intubation was then minutely described on the cadaver, faulty technic and complications arising therefrom concluded a most interesting and instructive paper.

DISCUSSION.

DR. M. P. WARMUTH, in opening the discussion, confined his remarks to the clinical side of the subject. The position of the child, the care in the selection of the tube, and the size as well as the age of the patient must be taken into consideration. A tube requiring much force for its introduction should be promptly discarded for a smaller one to avoid traumatism and spreading of the diphtheria deposits; furthermore, a tube that is too large may cause pressure necrosis, resulting in peri-chondritis, chondritis, complete destruction of the cartilages and calibre of the larynx, necessitating tracheotomy.

In patients with stenosis of the larynx resulting from prolonged use of the tubes, efforts to dilate by means of steel sounds usually

fails of technical results. When the patient is not relieved after the introduction of the tube, it indicates a deposit of membrane below the tube and necessitates a low tracheotomy.

DR. E. B. GLEASON recalled the first demonstration of intubation in Philadelphia. Dr. Shimwell performed the operation on a volunteer medical student at the Medico-Chirurgical Hospital.

DR. G. W. MACKENZIE, in complimenting Dr. Bemis, said that his demonstration was equal to any he had seen at the Kinderhospital in Vienna.

DR. BURNS asked how long it was possible for the tube to remain in place without doing harm.

DR. SKILLERN inquired the mortality in those cases requiring intubation.

DR. BEMIS, in closing the discussion, replied that he had never had occasion to apply oxygen. The mortality rate varies, depending upon various conditions, and delayed cases often develop pneumonia and edema. The tube can be left in position seventy-two hours or even more. One tube remained *in situ* six days. As regards feeding, there is usually no difficulty in swallowing and the child eats as usual. The voice is usually normal in a few days. Slight hoarseness may persist indefinitely.

Regular Meeting, March 26, 1912.

ROSS HALL SKILLERN, M. D., PRESIDENT.

Presentation of Patients. By E. MATLACK, M. D.

The first, a young woman, aged 26, had suffered from laryngeal trouble since 14 years. Operation, performed several times previously, was always followed by improvement lasting from one to three years. Recently she has become very hoarse and unable to articulate much above a whisper. Examination: Perfectly formed larynx with the exception of growth on the vocal cords at their posterior fourth. The right cord showed an irregular whitish growth which apparently extended from the extreme posterior end along the edge of the cord in such a manner as to prevent approximation with the cords of the opposite side, *vis a vis* presented an irregular serrated appearance. Diagnosis: Recurrent papilloma of the larynx. The Wassermann reaction was negative.

The second patient, a girl of 20 years, gave a history of laryngeal disturbance for several years; no pain; hoarseness and loss of voice

principal symptom complained of; no cough, expectoration nor history of night sweats. Wassermann reaction was negative. Examination: Glottis difficult to be seen on account of overhanging epiglottitis and sensitiveness of pharynx. After cocainization a better view was obtained; flat, non-pedunculated, warty growth about the size of a split pea situated on the anterior commissure, which prevented approximation of cords by mechanical obstruction.

DISCUSSION.

DRS. MACKENZIE, GLEASON AND ROWAN fixed the diagnosis as a papilloma, and owing to the vascularity and fear of edema of the glottis, a thyrotomy was advised.

DR. MATLACK, in closing the discussion, agreed as to diagnosis and operative procedure.

Presentation of Two Patients Operated on by Killian's Method for Chronic Frontal Sinusitis. By E. B. GLEASON, M. D.

First patient, aged 35, had been suffering since student days with purulent discharge from the nose and extreme headache. The diagnosis of frontal sinusitis had long since been made and many intranasal procedures had been tried, with but temporary relief. A solution of lacto-bacilline was injected into the sinus. Autogenous vaccine treatment had been employed.

As his condition seemed to continually grow worse, he requested that the external operation be performed. A complete Killian with removal of the ethmoid labyrinth and anterior sphenoidal wall was accomplished. The patient's recovery was uneventful. Two weeks after the first operation a Caldwell-Luc operation was performed on the maxillary sinus. Status praesens. A scar of the Killian incision barely visible. Slight depression of forehead above internal angle of the ridge. Distressing symptoms of headache and mental disturbances have disappeared. A very slight discharge from the nose remains.

Second patient, boy aged 18, previously entirely well, awoke one morning and found right eye bulging and dislocated forward and outward. Great pain on pressure, with headache, which quickly augmented so that the patient was obliged to be taken to the hospital. One of the assistants in the eye department made several incisions above and below the inner canthus, without finding pus. Sight of the eye practically gone. Dr. Gleason was called in consultation and recommended a radical Killian, which was done the day following his admission. On separating the periosteum from the orbital plate of the ethmoid a necrotic area about the size of a finger nail

was discovered in the bone, through which large quantities of pus immediately welled out. The ethmoid labyrinth was exenterated and the sphenoid sinus opened. Drainage was made with a long strip of iodoform gauze and the external wound closed. Acute symptoms entirely disappeared and patient made an uneventful recovery. Status praesens. There is still marked exophthalmos, but sight is gradually returning. All symptoms of sinusitis have long since disappeared.

Demonstration of Case Upon Which a New Intra-nasal Operation was Performed for Chronic Maxillary Sinusitis. By ROSS HALL SKILLERN, M. D.

The method was as follows: An incision was made in the lateral wall of the nose in front of the attachment of the inferior turbinate, extending well down into the floor of the nose. The mucous membrane was elevated in front of and extending beneath the inferior turbinate on the lateral wall. The soft tissues are then elevated on the facial side of the pyriform aperture, leaving the cristipyriformis removed from the height of the insertion of the inferior turbinate to the floor of the nose, thus creating a large opening into the maxillary sinus. The antrum can then be inspected almost in its entirety and all diseased mucosa removed with a curette. A strip of iodoform gauze is introduced; thus completing the operation. The operation obviates removal of any portion of inferior turbinate and has the advantage of allowing one to directly inspect the interior of the sinus cavity.

DISCUSSION.

DR. G. M. COATES said that he thought this operation had every advantage over the old intra-nasal procedures and was easy to carry out. He suggested that more of the mucosa be removed to prevent premature closing of the wound.

Presentation of Patient. By GEORGE MACKENZIE, M. D.

Four years ago the man noticed a swelling in the canine fossa, which persisted and remained painless until eight months ago. At that time the tumor increased in size and became tender and continued so until four months ago, when he reported to his physician, who suggested removal of the first bicuspid tooth. The procedure was not followed by the improvement anticipated. One week later the tumor, which had become fluctuating, was incised by the doctor, and a quantity of foul smelling pus evacuated; the cavity discharged pus for several days, and at that time patient was referred to Dr.

Mackenzie. On examination a dentigerous cyst was found and was thoroughly curetted under ether, leaving a cavity which would accommodate a hulled walnut. In no wise could there be found a communication with the maxillary sinus. An opening into the sinus is rarely observed and then only when the cyst ruptures into the sinus. The bulging covered with parchment-like bone crepitating under the finger is very characteristic.

Exhibition of Brain Showing Abscess of Left Frontal Lobe Secondary to Accessory Sinus Disease. By G. M. COATES, M. D.

Clinical history: Patient, woman 30 years of age, with no specific history obtainable, had suffered with headaches for three or more years. She first came under observation in May, 1911.

Examination showed much hypertrophy of the middle turbinate and suppurative discharge on left side. Anterior end of middle turbinate, with slight returning sense of smell, which had been absent for years. Persistently refused further operation until January, 1912, when her ethmoid labyrinth on left side was exenterated and anterior wall of sphenoid removed, giving her total relief from headache for over a month. The wounds healed rapidly and completely. On the return of the headache a radical operation was again advised and refused. The naso-frontal duct was enlarged, however, but without relief. She was lost sight of for a month, and when next seen at her home was in a semi-comatose condition, being treated by her attending physician for hysteria.

She was removed to the Pennsylvania Hospital, where she presented the following condition: Semi-comatose, though she could be aroused; all reflexes active. Kernigs sign absent and no sign of meningitis. Choked disc on left side marked and beginning on right. Left pupil dilated and irresponsive to light, less so on left. Intense tenderness over left frontal area. Incontinence of urine and feces. Wassermann partly suggestive. Purulent discharge from left nares. Temperature sub-normal. Pulse 60 and below. Abscess of brain diagnosed. Immediate operation showed entire absence of left frontal sinus and probing of brain tissue failed to demonstrate pus. Trephine opening over left temporo-sphenoidal lobe also failed to reach abscess. Death 12 hours later, after regaining consciousness.

Autopsy: No signs of meningitis anywhere. Well localized abscess-cavity containing over one ounce of greenish-gray, thin pus found occupying anterior half of left frontal lobe. Cavity size of a large walnut, with numerous pockets projecting from and opening into main cavity. Well marked abscess wall 3 mm. in thick-

ness. Abscess confined chiefly to inferior and middle frontal convolutions extending to nearly $\frac{1}{2}$ cm. of the orbital surface and $\frac{3}{4}$ inch of the frontal surface of the frontal lobe.

The tract of the probe from the frontal wound extended to about 1 cm. of the abscess-cavity. Abscess-cavity situated directly over the left olfactory bulb and extended over the left optic nerve. The bone of the anterior cranial fossa and cribriform plates, normal.

DISCUSSION.

DR. MACKENZIE: The most frequent causes of brain abscesses are middle-ear suppurations. The development of brain-abscesses is slow. In this case there may have been a small necrotic area in the roof of the ethmoid cells which could possibly escape detection from the cranial side. All brain-abscesses are due to infection from pyogenic micro-organisms. A cerebellar abscess is frequently preceded by an extra-dural abscess, and, too, we oftentimes find a fistulous tract uniting the primary extra-dural with a cerebral abscess-cavity.

In the course of cerebral abscess we note four typical stages. First the initial stage, which denotes primary invasion of the infection from one of the accessory cavities to the brain. Such manifestations as slight temperature, headache and malaise may be present and may be readily passed over by the family physician as a so-called bilious attack, for there are no focalizing symptoms in this stage. Secondly, a long, latent stage of cerebral abscess. It is variable. Knapp says the duration of this stage on one occasion was ten years. During the latent stage there may be few or no symptoms. Loss of weight. Slow cerebration. (MacEwen) Third, the manifest stage. Pressure symptoms. Fourth, the terminal stage. Rupture of the abscess into the ventricles.

DR. SKILLERN stated that he saw this case in consultation with Dr. Coates, and strongly advised immediate radical operation. If this had been followed out at that time the chances are that the patient's life would have been saved.

DR. ROWAN said it is surprising that there are not many more fatal cases. He now has a patient with rather disquieting symptoms suggesting frontal sinus involvement which he is watching very carefully.

DR. COATES, in closing, said that the patient suffered from incontinence of urine and feces for three weeks while under treatment in another hospital for hysteria. In response to an inquiry he stated that there were no focal symptoms except frontal tenderness and eye symptoms.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, December 27, 1911.

DR. LEE M. HURD, CHAIRMAN.

DISCUSSION OF DR. MYLES' PAPER.

(Continued from page 261.)

DR. QUINLAN took exceptions to Dr. Myles' incision in the second case. He did not think it was justifiable to present an uncosmetic result when the same effect might be obtained with a long incision across the eye-brows. Although he had at times been tempted to follow Dr. Myles' advice in this respect, he felt that he was not giving himself a sufficient sweepage in order to get free room and further space; he had always felt that there was a moral restriction upon him to produce the best cosmetic result. By a double wing incision through the eye-brows and across the nose, one can get enough room to clear out the interior of both sinuses; he had seen some that almost reached the hair line. He did not feel that he could endorse this perpendicular incision, and wished to record his protest against it. Dr. Myles was to be congratulated on the first case presented, which certainly showed a splendid result.

DR. HARMON SMITH said that he wished to emphasize one point spoken of by Dr. Myles in regard to the adhesions forming in the upper part of the nasal chamber and blocking off the frontal sinus. This was apparently due to shreds of mucous membrane being left in place, which finally united in one obstructive mass. He thought with Dr. Quinlan that the perpendicular incision should be avoided, and that a transverse incision extending even over the other eye resulted in less marked deformity than the perpendicular or slanting incision. In his experience it had not been necessary to go so high on the forehead, but that might have been due to the existence of smaller sinuses.

DR. MYLES said that he appreciated the criticism expressed, and would freely admit that any improvement that could be made was very desirable, but that he believed the frequent failure in these serious frontal sinus cases—and so many do fail—

was due to a more or less incomplete operation, the operative procedure being influenced by fear of producing deformities and scars; and that if we wish to cure these cases which have been operated on previously by one or more operators with failures, or the cases of malignancy, we should necessarily cause some scars or deformities. The tissues of the man with the sarcomatous growth were badly infiltrated and the skin could not be retracted above the top of the sinuses, and if any of the diseased tissue had been left he would have had a recurrence. If the nerves and blood-vessels on the opposite side had been cut, it might have affected his eye, and as he was a diamond setter by occupation he needed his eye very much. It was much the same with the other patient. The adhesions were very tough. He had been operated upon before, and there was complete adhesion of the periosteum which had become cicatricial and would not give. The scar was not so very noticeable. In his opinion, the chief objection was that the scar-tissue over the depression caused by the primary union militates against the proper introduction of paraffin. One cannot elevate the tissue so well with paraffin. His intention in the future was to make the incision over the parts where the bone would not be removed, so that the scar-tissue would not be over the region where he wished to place the paraffin.

Two Cases of Foreign Body Removed Respectively From the Bronchus and Entrance of Esophagus. Presented by EMIL MAYER, M. D.

The first case was that of a woman who had inhaled a gold cap which had covered a large molar tooth. The speaker was called in consultation in a neighboring city, and was informed that an unsuccessful attempt at removal had been made the day previous,—the body being seen, but it could not be extracted. The history was that it had been inspired six days before the speaker saw her, and the X-ray plate showed it to be in the right bronchus. Under anesthesia, using the Killian tubes with the Bruenings head-lamp, the bronchoscope was readily introduced and the foreign body seen and demonstrated. The concave portion of the foreign body was downward, so it had to be rotated before it was grasped, when it was promptly removed. In the meantime, the anesthesia had been continued per rectum, and was most satisfactory.

The second case was that of a lady who came to the speaker's office complaining of severe radiating pains in the throat, occurring

immediately after eating some bread that morning. A most searching examination with the tongue depressor and laryngeal mirror revealed nothing; but with the short bronchoscopic tube the deeper structures were examined, and at the entrance to the esophagus in the lower pharynx two splinters of wood were seen embedded, and were removed,—each of them being half an inch in length. Some soreness remained, but all pain subsided within a short while.

Commenting upon these cases the speaker said that the first case was by far the easier of the two, as the diagnosis had been made beforehand and the location of the foreign body was exactly known. Under ordinary circumstances the second case would have been dismissed, as nothing could be seen by the usual methods, and it illustrated again the great value in diagnosis and treatment that the bronchoscope has brought to our aid.

Paper: Vincent's Angina in Infants: A Study of Twenty-four Cases Occurring During Eight Months at the N. Y. Foundling Hospital. By J. A. MULHOLLAND, M. D.

(To be published in full in a subsequent issue of THE LARYNGOSCOPE.)

DISCUSSION.

DR. HAYS said that during the past year he has seen quite a number of these cases in one of the infant asylums with which he was connected, and in almost all the cases the symptoms agreed with those described by Dr. Mulholland. There were a great many cases of stomatitis and noma in this institution, and at that time none of the noma cases had signs of Vincent's angina, but most of the Vincent's angina cases were accompanied by a stomatitis. Most of the cases, when first seen, were thought to be diphtheria, and cultures were taken which proved negative. In most cases small superficial circumscribed lesions were found, usually about half an inch in diameter. The children had little or no temperature and did not complain, and nothing was seen but these ulcerations and some swollen glands. Six such cases were seen within two or three months. It seemed to attack the smaller children, though not in any special ward. In all of these cases tincture of iodine was applied daily, the gums kept clean with boric acid, and attention given to the child's general condition. They all recovered.

DR. KENEFICK said that before giving the active work of the hospital over to Dr. Mulholland, he had seen isolated cases of Vincent's angina identified microscopically, and they appeared to yield to treatment readily. An interesting question, which had been con-

sidered when he saw these cases, was whether it was an endemic condition in the hospital. The question also arises as to whether or not the exfoliation of the superficial epithelial cells due to the angina made the children more vulnerable to other infectious organisms. He had not noted that before, as the children had all made good recoveries. He was much pleased when Dr. Mulholland said that he has corralled these Vincent's angina cases and established the fact that the disease could be quickly and completely stamped out of the institution.

DR. EMIL MAYER said that he had his doubts as to whether the number of cases presented were sufficient to establish the fact that Vincent's angina was, after all, a communicable disease. It is seen so often in children in public institutions, clinics, etc., and there recognized because smears are taken and examinations made. This is not invariably done in general practice. It is also noted that only one member of a family may have the disease, the others escaping. As to the treatment Plaut and Vincent suggested the idea of iodine, which the speaker always used with satisfaction. We are apt to look upon the angina as a harmless affection, and yet occasionally we learn of fatal endings, or the affection involves other parts of the body or produces very serious complications, as in the case presented before the section by Arrowsmith. The speaker was especially interested in this subject, as he had had the honor of being the first to call attention to this diseased condition in any English-speaking community. This presentation was made before this section under the presidency of Dr. William Kelly Simpson. Much has since been written on this subject in our journals, a most notable contribution coming from Dr. William N. Berkeley of this city.

DR. YANKAUER said that we hear a great deal about Vincent's angina in the throat, but it is not generally known that it also occurs in the nose. Some time ago a patient consulted him on account of nose-bleed, and examination showed an ulcer surrounded by the membranous deposit characteristic of Vincent's angina. There were also several patches on the soft palate. All of these patches, including the one on the septum, showed the bacilli. It is worth while to remember this.

DR. HAYS said that during last year two physicians came to him complaining of a very painful focus in the throat, and both presented a very unusual form of Vincent's angina. Neither had any sloughing ulceration, but simply showed a loss of substance just

above the tonsil. Cultures were taken in both cases, and both showed the Vincent's bacillus and spirillum. Both got well in four or five days under application of iodine, and both said that the pain in the throat was extremely severe. No glandular enlargement was present.

DR. SIMPSON, referring to the similarity of Vincent's angina to follicular tonsillitis, said that he had seen a case in an adult who gave the ordinary subjective symptoms of tonsillar affection. Examination of the tonsil revealed an absolute picture of follicular tonsillitis, without any sign of the ulcer or abscess seen in Vincent's angina, and by looking at it one could not differentiate it from the ordinary tonsillitis. A culture was taken, however, and it proved to be Vincent's angina. It followed the exact course of an ordinary follicular tonsillitis, without the formation of the typical necrotic area.

DR. HURD asked if Dr. Mulholland had not found some enlargement of the glands in every case. The prognosis seems to be mild in children, but is sometimes very severe in adults. On looking up the literature he had found that Bruce in England (*Lancet*, July, 1904), had reported three deaths in eleven cases. He had read a paper on this subject in 1908, and three deaths were reported in the discussion. Was it not rather characteristic to find the organism plentiful, and then under the application of a caustic disappearing so that no organism could be found? It seems to alter the picture very quickly. When looking up the subject he had found a number of cases of gangrene of the tonsil, and death from Vincent's angina not recognized as such.

He reported a case in a young man, which cleared up. Two or three months later he enucleated this young man's tonsils, the Vincent's organisms returned in the pockets, and it was some time before the patient recovered from that condition. When first seen, the patient had been referred with a diagnosis of secondary syphilis. Later, he got syphilis, and was sent back with a diagnosis of Vincent's angina. The diagnosis of syphilis was clinically made, and four Wassermann tests were all negative. The man evidently had two affections. One was a syphilitic patch, the other was Vincent's angina. The case went on for a month or six weeks,—some saying that it was syphilitic and others that it was not. At last a dose of "606" cleared it up in a few hours.

DR. CARTER asked if the cured cases had a tendency to recur. Two years ago he had a case of Vincent's angina in a young man,

35 years of age. After somewhat prolonged treatment he was cured, but returned about eight months later with a second attack. On both occasions microscopic examinations were made and the spirillum was found. On Christmas eve the same man was back again, and unquestionably had another attack of Vincent's angina. A microscopic examination had not yet been made, but the local appearances showed all the symptoms of Vincent's angina.

DR. SWAIN said, apropos of some of the remarks of Dr. Mayer, that a number of years ago,—about 1890,—he had under his care in the clinic, a child with a very peculiar-looking sore throat. He made a smear and found a large fusiform bacillus, but knowing nothing of it and not being able to find anything about it in the literature, the incident escaped his mind until a long time after, when Vincent made his first report. Then he concluded that if he had only been a little more persistent he might have been hailed as the discoverer, and that it might have been called Swain's bacillus instead of Vincent's. The last speaker had reported a case where the organism appeared several times in the same individual. He himself had recently treated a student who, on two former occasions, had had a well-defined case of Vincent's angina, as demonstrated by microscopical examination. Twice it came on one side, and once on both sides. Apparently the germs get into the crypts and lie dormant until something stirs them up. That this may be the case is proved by the following interesting instance. One day a woman in the hospital complained of a sore throat, and examination revealed a cheesy bit of the ordinary caseous material in one tonsil. On squeezing the spot, a lot of material came out from the crypt, as cold cream would come from a tube. One of the internes examined this material and found a pure culture of Vincent's bacillus. There was not the slightest history of previous trouble. The thing was evidently in a dormant state. After it was squeezed out nothing more happened. The woman has had no ulceration then nor during her prolonged stay, for other reasons, in the hospital.

Dr. Kenefick had spoken of the easy vulnerability of the germ and the possibility of the germ's low power of resistance. This would explain why the cases cure up very readily under a variety of different methods of treatment. He had exploited the possibilities of zinc chloride, and found it almost a specific, except in one patient who died as the result of the disease. It ulcerated out in between the blood vessels of the neck and the patient died of hemorrhage.

His cases had been principally in adults, and especially among students, having had very few that he could remember in private families. The only time he had seen it in a child was the case just referred to when he came near discovering the bacillus. He had been especially interested in this discussion, and would like to know whether Dr. Mulholland had discovered any cause for the condition,—how it gets to the children. It would be very desirable to have some light on this point.

DR. CARTER said that in citing the case he had referred to he had wished to bring out a discussion in regard to whether there was any predisposition on the part of certain individuals to this infection. It would seem that in the case he had spoken of, where the young man had the second attack eight months after the first, and again sixteen months after the second attack, there must be something more to account for it than the hibernation of the bacillus in the throat all that time.

DR. MAYER said that both Plaut and Vincent had raised the question of priority, and it might be of interest if his friend, the previous speaker, would enter the list. His own modest statement was that his paper on the subject had been the first one written in the English language.

DR. MULHOLLAND, referring to Dr. Kenefick's question as to whether this condition of the mucous membrane predisposes to other diseases, said that he had not observed that it did. Wilson and Andrews (*Dominian Medical Journal*) have said that the organism of Vincent's angina had never been found with diphtheria, but had with lues.

Dr. Emil Mayer had spoken of its being only mildly contagious. In the *Journal of the American Medical Association* for May, 1910, Fraley speaks of an infection through an intermediate party, and cites several cases which occurred in his practice. The fact of its contagiousness was not proved, but the fact that there were 700 children in the foundling hospital altogether, and that there were among these twenty-four cases in less than six months' time; while out of the 1500 children brought there every month by their mothers for examination, as required by the laws of the institution, the disease was not recognized in any, was very suggestive. In the Manhattan Hospital, out of over 90,000 cases in the past three years, only seventeen cases were observed. They had never been able to get a pure culture, although Tunnicliff reports favorably on cultures from his cases.

Replying to Dr. Yankauer's remarks, he said that he had not seen any cases of this disease in the nose, only in the usual location, the throat.

Replying to Dr. Hurd, he remarked that only the worst cases had shown cervical adenitis.

In regard to caustics: It had been their experience that the application of these causes the bacilli to disappear very quickly but that thirty-six hours later they spring up again. A peculiar thing was that in normal children in the same ward they had been able to find the germ in great quantities in practically normal throats.

Replying to Dr. Hurd and Dr. Carter he said that the cases do recur. One attack does not produce immunity. Dr. Swain had spoken of its frequency in adults and had said that his cases occurred even in well-nourished individuals. Dr. Richardson, of Washington, also speaks of its frequency in young adults, especially male adults. Our observations had to do with institutional children. We had no idea of the cause of the focus in Nursery No. 3. It had been going on there for many months with no cases in the other nurseries.

Intra-orbital Lesions Secondary to Disease of the Accessory Sinus of the Nose. JAMES W. WALTERS, *Jour. of Ophthal. and Oto-Laryngol.*, March, 1912.

The sphenoid and post-ethmoid cells, owing to proximity and often dehiscences may, when diseased, cause changes in the optic nerve and the nerves that enter the sphenoidal fissure, such as progressive descending neuritis followed by atrophy of the optic nerve and paralysis of the intrinsic and extrinsic muscles of the eye. Involvement of the more anterior sinuses, like the frontal, antrum and anterior ethmoid may obstruct drainage of lacrimal duct, dislocate the eye-ball, create muscle imbalance, besides swelling and congestion of the mucous membrane, headaches, photophobia and cellulitis.

STEIN.

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL
AND OTOLOGICAL SOCIETY.

Seventeenth Annual Meeting, Atlantic City, June 1-3, 1911.

CHEVALIER JACKSON, M. D., PRESIDENT.

DISCUSSION OF DR. MCCULLAGH'S PAPER.

(Continued from page 293.)

DR. SIDNEY YANKAUER wished to emphasize certain points with reference to the indications for this operation. Consideration of the pathology of chronic suppuration would lead to a realization of the fact that all cases originate in disease of the naso-pharynx, and that where the disease has existed as long as in many of the cases just reported, various pathological changes have taken place in the middle-ear and mastoid cells. Some of these changes are very slight, while in others they are of greater severity; there may be slight changes in the ear, necrosis in the attic, disease of the mastoid cells, collections of pus around the sinus, or, in the subdural space, etc.

In order to cure chronic suppuration two surgical factors are necessary: first, to drain the purulent area, and second, to prevent re-infection. Re-infection taking place through the naso-pharynx must be prevented by preventing the entrance of the germs through this region. This may be accomplished in various ways. An autogenous vaccine may be used; if properly made and employed this will destroy the kind of germs from which it is made wherever they may exist in the body. But there is no way of knowing that a new infection will not arise. The only way to prevent such a contingency is to close the Eustachian tube. The necessity of closing the tube in this class of cases is shown by the improvement which follows this procedure. When the radical operation is done, the tube can be easily reached. Just as in the radical operation it is necessary to close the tube in order to secure healing of the parts, so it is in other cases. In all the minor operative procedures which can be carried out through the canal, success will result if the tube be closed. Whatever the form of treatment the closure of the Eustachian tube is a necessity. This should be the first thing to be done. His own experience has shown that a certain number of cases will be cured by simple operations on the middle-ear, others will always require radical procedure.

Dr. McCullagh had not succeeded in inverting the tube; that is not necessary. The speaker had failed to accomplish this in a

majority of cases. In doing this, large curets should be used first, to be followed by the use of smaller curets for cleaning out the angles.

DR. NORTON L. WILSON had had several cases cured by this operation, two of which he desired to report. The first had been under observation for over two years. The Heath operation was performed, without improvement; autogenous vaccine was employed for three months, and still the suppuration continued. After the Yankauer operation a permanent cure resulted. In the second case the ear had been discharging for years. This was checked by the operation under discussion. Hearing was diminished, and the patient, who was neurasthenic, constantly complained of a sense of fullness in her ear, for relief of which she made insistent demand.

DR. S. J. KOPETZKY said the technic of the operation is very simple and easily performed. He has employed the method in nine cases, only one of which was cured. In two others the results were doubtful because, although they became "dry," the result was not free from suspicious circumstances in that they all had had previous periods of varying duration, during which they had been "dry." In six other cases there was no effect noted from the Yankauer operation. It was only fair, however, to add that these six cases had been selected cases in which no cure was to have been expected by anything short of the radical mastoid operation. They were submitted to this operation (the Yankauer) because they came within the range of indications for it as laid by Dr. Yankauer, last year, which the speaker then thought were far too sweeping.

The speaker thought that Dr. Duel has struck the true key-note in his discussion yesterday, when he intimated that all these procedures have individual value in given cases, and one is not a substitute for the other. The Yankauer operation is not a substitute for the radical mastoid operation, although from the reports given this morning, where ossicles were removed, the tympanum curetted, and the Eustachian tube closed, the speaker failed to see wherein the Yankauer operation as now advocated left the patient in any different status than he would be, were a limited Stacke operation performed, leaving out of account the mechanics of the two procedures.

It was interesting to listen to Dr. Yankauer's advocacy of closing the tube, and Dr. Holmes' of keeping the tube open, in similar groups of cases, and both reporting cures. From a theoretical point of view it would seem that where the tube is kept open and the case

cured, that one had succeeded in more nearly approximating the normal physiological condition of the ear.

Dr. McCULLAGH, in closing the discussion, referred to Dr. Kopetzky's remark concerning the facilitating of a cure by keeping the tube open, as suggested by Dr. Holmes, and said he did not consider that a drum-membrane with a perforation approaches the normal.

Replying to Dr. Allport, he reiterated the statement made in his paper that the method under discussion saves a percentage of cases from the radical mastoid operation. What that percentage is he could not say, but no matter what it be, it is a gain in the conservative surgery of this condition. The operation is so slight that it is really not an operation from the patient's point of view. In the event of failure, the radical operation can be employed.

The operation is intended for chronic cases, where the ossicles are more or less disturbed, and where they have no effect at all upon the hearing. The object of removing the ossicles is solely for the purpose of getting freer drainage and obtaining surgical cleanliness in the cavity.

The Medico-educational Problem of the Deaf Child. By G. HUDSON-MAKUEN, M. D.

(Original Contribution to THE LARYNGOSCOPE, p. 683, June, 1911.)

The Practical Value of Lip-reading. By MAX A. GOLDSTEIN.

(Original Contribution to THE LARYNGOSCOPE, p. 619, May, 1911.)

DISCUSSION.

PROF. JOHN DUTTON WRIGHT said: I have listened with great interest to the two valuable papers that have just been read. I was delighted with Dr. Makuen's little patient and congratulate him upon what he has been able to do for her. He spoke of his observation, that during the last year she had begun to notice sounds to which she had formerly appeared to be wholly deaf. That is a very common occurrence with my own pupils who have, like Dr. Makuen's patient, some slight power of sound-perception. The persistent training which they receive in the use of this slight hearing, which can be somewhat accurately described by the term "latent," fixes their attention upon the impressions that are received through it, and gives a significance to sounds that had always reached them perhaps, but had been ignored because they brought no help or information. In the last analysis we hear with our brains, and it is a matter of common observation that when our attention is occupied we actually do not hear sounds about us that are foreign to our thoughts, but ignore them as valueless. We

frequently say of these children, "How much more they hear!" Whereas, in all probability, the actual power of sound-perception has not increased, but the brain has been trained to discriminate and interpret the sounds, with the result that ideas are generated.

I most heartily endorse the strong paper read by Dr. Goldstein, and feel sure that much benefit will come to the deaf through the increased interest which otologists are showing in the educational phase of their treatment.

The acquisition of the ability to interpret speech by the visible movements involved in it, with little or no aid from the ear, is surrounded with much the same difficulties as the acquisition of any other intellectual accomplishment. If a profoundly deaf person will put forth the same amount of effort, and spend the same amount of time in the study and practice of the art of lip-reading that even an ordinary player on the piano must expend in order to acquire a very moderate degree of proficiency in musical expression and comprehension, he or she will reap a much greater reward of personal satisfaction and comfort than the pianist secures? I believe that, while there may be some persons who cannot acquire even a moderate skill in music, there is no one who cannot acquire a most useful amount of skill in lip-reading. But, just as there are natural musicians, so there are natural lip-readers. Some attain it almost without conscious effort, and wholly without instruction. To others it comes slowly and laboriously. The best lip-readers are entirely ignorant of the "technic" of lip-reading, and the laws of phonetic analysis upon which it is based. But there are other minds that do not seem able to grasp it intuitively, and so must have the anatomical structure laid bare and explained before they comprehend the significance of the visible forms. As it is a purely intellectual process, involving practically no muscular activity, the psychology of it enters largely into the problem. For this reason a cut-and-dried system of instruction in lip-reading is, perhaps, less applicable to all cases than fixed methods of instruction in most other useful arts. For example, in the case of one individual, the introduction at the beginning of his instruction of a systematic analysis of the phonetic elements of language from a standpoint of visibility and resemblance, may ruin the chances of final success of the pupil, while to another mind it is a necessary preliminary. In general, my own observation has been that the technic of the art should be taught last, and the earliest efforts should be aimed at the establishment of the proper habits of thought and mental attitude toward spoken language.

While it is perfectly true, as Dr. Goldstein has said, that the obstacles to success in lip-reading have been sometimes exaggerated, and candidates have been unduly discouraged from undertaking the work, it is also true that people have sometimes been led to expect too much. Owing to the absolute difference in the construction and operation of the eye and ear, they cannot be wholly interchangeable in the performance of their functions. Owing to the fact that the eye must be consciously focused upon the source of the impressions transmitted by it to the brain, it is impossible for a lip-reader to follow a rapidly shifting conversation in a group of people when the point from which the next remark may come is not apparent. For the same reason, owing to the conditions of light and movement at the theater, and to a somewhat less degree at church and lectures, it is impossible, ordinarily, for even an expert lip-reader to get more than an occasional phrase or sentence. But by far the greater part of the intercourse of life is, or can be, individual and face to face, and here lip-reading reaches its maximum efficiency.

Dr. Goldstein has touched upon a vital point in his reference to the need of teachers of lip-reading scattered throughout the country, and I most earnestly urge upon your attention his very practical suggestion of a way of supplying this need. He urges otologists in various parts of the country to search out promising persons and induce them to go to some training-class and fit themselves to teach lip-reading. My more than twenty years of service along this line has convinced me that at present no single place of training possesses all that is of value. I believe that there should be such a center, and I believe that this organization could be instrumental in creating that center. I very much wish that your society might choose a bright, wide-awake young physician physically and mentally adapted to the teaching of lip-reading, and induce him to enter upon this task, by going to the fountain-heads of information on the subject, both in this country and in Europe, with the understanding that when he has gathered all that is worthy of adoption he shall establish himself in some centrally located city, where, under the patronage and with the endorsement of this powerful organization, he may become the nucleus of a school exclusively devoted to the training of teachers of lip-reading in whom the medical profession may repose the greatest confidence. It would be perfectly feasible for the members of this society to send to him an adequate number of students for training, each of whom would pay a reasonable amount for the course, and on their return to their respective communities, you gentlemen would easily be able to supply them with a satisfactory number of pupils.

If this report should be favorable, you could then give the matter such publicity as would bring applicants for the work from whom you could choose the one that seemed best fitted to undertake it. The members of the society would naturally reserve to themselves the privilege of nominating candidates for the training, and the institution might be known as "The Trilogical Training School for Teachers of Lip-Reading."

DR. B. R. SHURLEY heartily approved of the presentation of this subject before the society at this time, and of the spreading of information to the profession at large concerning this important problem. As the internist has busied himself with the problems of tuberculosis, and the ophthalmologist with that of ophthalmia neonatorum, so the otologist should devote his attention to the question of the deaf-mute. The society and other similar organizations could accomplish an enormous amount of good by the dissemination of knowledge concerning the care and development of deaf-mutes. Of the schools for the teaching of the deaf in the United States, only four are located in the West, and none in the South. Practically all deaf-mutes could be taught by the oral method, yet only about twenty per cent of them receive such instruction at the present time.

The value of lip-reading in cases of otosclerosis is not duly appreciated. Many such cases leave the otologist with practically all hope gone. This should not be so; the otologist should be able to give some hope of instruction which would lead such patients to greater usefulness. The problem of teaching the deaf in the large cities should be developed thoroughly. One method of disseminating knowledge on this subject is through the state medical societies. Papers embodying the essential facts and the most progressive ideas on the subject would accomplish a great deal.

DR. MAKUEN, in closing the discussion, expressed hearty sympathy with the motion just passed, and also with the remarks embodied in Dr. Goldstein's paper. He was looking forward, however, to a broader work than that suggested, a movement which would include defects of speech. He considered it of great importance to correct defects of speech, of which deafness is one of the causes. He would like to see a training-school started for the training of teachers for the correction of defects of speech, including the training of the deaf and lip-reading.

